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Denis Cogneau¹, Yannick Dupraz² and Sandrine Mesplé-Somps³

Preliminary version June 2018, under revision

Abstract –

A novel data collection provides comparative evidence on colonial states of the ‘second’ French colonial Empire, since their foundation to their devolution in the 1960s. Colonial states were neither omnipotent Leviathans nor casual night watchmen. On the one hand, we emphasize the extractive efficiency and capacity of adaptation of colonial states to varied socioeconomic contexts and to varying historical conditions. On the other hand, we put forward dualism as the main common feature and legacy.

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Fiscal Capacity and Dualism in Colonial States: The French Empire 1830-1962

Denis Cogneau⁴, Yannick Dupraz⁵ and Sandrine Mesplé-Somps⁶

Preliminary version June 2018, under revision

A sufficiently autonomous government, able to implement large scale efficient policies and to bargain deals with domestic and foreign capital, is most likely a major ingredient of economic development, if only for late-starters (e.g., Gerschenkron 1962; Amsden 2001; Adelman & Morris 1997 provide a review). Therefore the consolidation of state capacity, involving in particular the building of a strong tax base, is today widely considered as one of the most important challenges that poor countries must face (Besley & Persson 2011). Yet, as argued by Hoffman (2015), historical state building experiences, in all their diversity, are very much under-studied. A great deal of the history of the State overwhelmingly relies on the experience of Western European countries (Tilly 1990) or of today's developed countries (Lindert 2004); the same is true for neo-institutionalist analyses (Dincecco 2015).

Even if the ways to improving state capacity can be deemed multiple and context-specific, “extractive” colonization is seen to have determined a bad start, distorting tax structure and expenditure patterns towards the interests of colonizers (Acemoglu & Robinson 2012). The recent literature draws its empirical evidence from fiscal and legal decisions taken within formally independent countries (Besley & Persson 2009, 2013 & 2014), so that it actually disregards the colonial context. Yet, independent states' structures did not start from scratch. Unfortunately, not much is known about colonial states on a comparative basis and about their evolution from the late 19th century to independence and beyond, especially in the case of Africa.

The use of the term “state” in a colonial context has been much discussed. Young (1995) emphasizes that the colonial state indeed lacked a few attributes of stateness: sovereignty, national doctrine and international existence. Yet, Young describes the African colonial state as a Leviathan (“*Bula Matari*” = crusher of rocks in kikongo language) displaying “the purest modern form of autonomous bureaucratic authority” (p. 160), especially at its supposed apex between the two World Wars. In contrast, Herbst rather characterizes it as “administration on the cheap” (p.73) with “limited ambitions” (p.77), and despite its brutality, unwilling and unable to extend its control. After the independences, Young sees a legacy of authoritarianism, Mamdani (1996) of “decentralized despotism” (pp. 37-61), whereas Herbst instead sees “non-hegemonic rule” persisting within (henceforth UN-protected) colonial boundaries, and Cooper (2002) the continuation of “gatekeeper” structures. To Bayart (1993) and Cooper (2014a), the African colonial state was to some extent a co-production of colonial rulers and autochthonous elites. Questions about the formation and action of colonial states and about postcolonial hysteresis of course extend outside Africa, if only for instance to South-East Asia studied by Booth (2007).

A novel data collection allows us to provide comparative evidence on colonial states of the ‘second’ French colonial Empire, since their foundation to their devolution in the 1960s. We extracted exhaustive and detailed public finance data from administrative archives, numbers and

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wages of civil servants by sector, as well as a set of outcomes of public investment like school enrolment, health inputs, infrastructure; covering the whole colonial period, and all French colonies in Northern and Sub-Saharan Africa and South-Eastern Asia (Indochina). We were also able to extend some of these data until the 1970s. In contrast with previous contributions on the British Empire, we believe it is fruitful to approach the colonial state not only from the side of taxation (Frankema 2010 & 2011; Gardner 2012), but also from the side of expenditure. The efficiency and sectoral allocation of public expenditures, “productive efficiency” in Besley and Persson (2011) terminology, are as important as the level and structure of taxes, i.e. “extractive efficiency”, for “growing public” (Lindert 2004). Besides, as already argued by Cooper, we argue that the years 1945-1965 correspond to a critical juncture that is crucial to document and analyze in order to deal with the “legacy question”.

We argue against a too naïve state capacity approach and provide a rather nuanced view of colonial states, that neither identifies them with omnipotent Leviathans nor with “night watchmen”. On the one hand, we emphasize the extractive efficiency and *capacity of adaptation* of colonial states to varied socioeconomic contexts and to varying historical conditions. On the other hand, we put forward *dualism* as the main common feature and legacy.

First, it is not that colonial states had very limited resources. We show that fiscal extraction was rather high. Hence even under a strict doctrine of self-financing, they could afford spending, and not only in order and control; they could even borrow and honor their debts. Further, colonial administrations did not stop investing in fiscal capacity when independence was foreseeable, after WW2; the causality rather ran the other way, with a needed “extension of franchise” implying more expenditures hence more taxation. Then colonial states modernized their fiscal apparatus and succeeded in increasing tax revenue, in order to invest in development in the hope of preserving imperial dominance. Fiscal capacity meant precisely the ability to adapt to context. The French Republic was able to resurrect *Ancien Régime* fiscal and legal features or to recycle precolonial states ways-of-doing, so that autochthonous population could be taxed, and in some places rather heavily. But, as political and socioeconomic climates changed, law and tax also changed, and turned more “progressive” by all meanings, at least after WW2. The context dictated the degree of modernization of the fiscal apparatus. Initially richer settler colonies of North Africa ended up with a more modern tax structure than poor countries of Sub-Saharan Africa where the dependence on international trade taxation turned high, consistently with the “gatekeeper” characterization.

Second, the true limitation of the colonial state was its very colonial nature. Expenditure was biased and costly. On the biasedness side, it had to serve first the interests of French colonists and capitalists, by favoring costly investments in railways and harbors to connect mines and plantations, but also by providing settlers with urban public services at metropolitan standards (education, health assistance, electricity). The larger the settlers’ enclave was the more public spending was needed. On the cost side, it had to rely on expensive French civil servants and army men, for tax enforcement, peacemaking, etc. This high cost meant that despite substantial fiscal capacity the colonies were still under-administered, in terms of the number of civil servants who could be financed and of the volume of public goods that could be produced. While development was costly from the start, it turned more and more costly as Autochthons began demanding more equality in pay or in access to metropolitan-level facilities; both “order” and “social” spending had to increase at the same time. And it turned costly to the metropolis, as extending the settlers’ enclave to the rest of the population meant large overseas redistribution

and ever increasing transfers. Dualistic economies and societies were born, as well as aid dependency, and both features survived the decolonization era. The independence years 1956-1962 indeed did not bring any new discontinuity: at the beginning of the 1970s, the new independent States had maintained the same size, and remained dependent of French aid for 5 to 15% of their expenditures.

The remainder of this paper is organized as follows. Section 1 provides a short historical background. Section 2 summarizes the data construction effort, described further in a large data appendix. Section 3 looks at tax extraction and distribution across space and time. Section 4 looks at spending, costs, and financing issues. Section 5 concludes.

1. Historical background and structural features

Our database covers colonies acquired during the 19th and 20th centuries, making the bulk of the so-called “second colonial Empire” of France. We disregard Syria and Lebanon that the French ruled between 1920 and 1945 under a League of Nations mandate, Djibouti a small trade post South of Eritrea, Comoros Islands, and Pacific Ocean islands. We also exclude the remains of the “first colonial Empire”: West Indies (Guadeloupe, Martinique), French Guyana, Réunion Island in the Indian Ocean, and the five trade posts of India.

*The settlement colonies of North Africa (NA)*⁷

Algeria was formally part of the Ottoman Empire, although with a large autonomy, before it was claimed by France in 1830.⁸ Conquest wars lasted four decades, the last large insurrection being the one of the *Kabylie* province in 1871. The population of French and other European (Spanish, Italian, Maltese) settlers more than doubled between 1871 and WW1. With the advent of the Third Republic at the same time, the settlers gained momentum against the military, and in 1900 obtained some autonomy in public finance, as a local assembly, the “*Délégations Financières*” would vote the budget.⁹ Algeria was divided in four major constituencies – three “*départements*” in the North, and a military territory in the South; French settlers were represented in the metropolis by a few deputies and senators. Formally speaking, since 1865 Algerian Muslims could apply for citizenship provided they complied with the French *Code Civil* (no polygamy or repudiation, equal inheritance for daughters etc.), but administrative procedures were cumbersome and more difficult than for the average foreign born in metropolitan France (Weil 2005). A lottery-based three-year military conscription was instituted in 1912, so that many young Algerian males were involved in the two world wars and in other battles starting with the conquest of Morocco (Clayton 1988). It is only after WW2, under the Fourth Republic, that Algerian indigenous subjects acquired some political representation in the metropolitan parliament. With the Fifth Republic in 1958, their representation was brought closer to their

⁷ For Maghreb-wide historical comparisons, see Valensi 1969, Rivet 2002, Katan Bensamoun 2007.

⁸ Algeria’s colonial history: Julien 1964; Ageron 1979 & 1990 Stora, 1991 & 1992 Rivet 2002; Bouchène et al. 2012; Mc Dougall 2017. On public finance one of the first references is Douël 1930.

⁹ In this assembly, indigenous representatives were granted a minority of 21 seats over 69, mostly composed of *caïds* who collaborated with the French administration. Cf. Bouveresse 2008.

actual population weight.¹⁰ Yet the liberation war had already started in 1954; casualties were most often restricted to rural areas and did not disrupt too much the economy. Algeria's independence was finally obtained in 1962, under strong international pressure (Connelly 2002).

Tunisia was also formally a possession of the "Sublime Porte", but had an autonomous government with diplomatic visibility. The French invasion of 1881 interrupted a process of modernization of the State, similar to the Ottoman *tanzimat* or to the reforms initiated by Muhammad Ali in Egypt.¹¹ Tunisia remained a protectorate, the official ruler of which was the *bey* of Tunis, even if actual power was exerted by the French administration.¹² French and Italian immigrants settled in numbers until WW1.

Morocco was until 1913 a formally independent kingdom, yet European imperialist interference, especially from UK, France and Spain, had grown heavier all along the second half of the 19th century; the kingdom was plagued by internal conflicts, resistance to reforms, and trade deficits, and got very much indebted towards the French bank Paribas between 1904 and 1910.¹³ Despite German opposition, the Southern part fell under French protectorate just before WW1 - a small Northern part being conceded to Spain, and received the same administrative organization as Tunisia: the king became a *sultan* holding formal power, and a governor was appointed by the French ministry of Foreign Affairs. Conquest wars in the Rif (Spanish part) and Atlas mountains lasted until the mid-1930s. European settlers were never as many as in Algeria or Tunisia.¹⁴

In both protectorates, French settlers were not represented in the metropolitan parliament until 1946, when they got two deputies for each colony, and had less say on policies than in Algeria. Regarding the Autochthons, a lottery-based military conscription had started as early as in 1883 in Tunisia, as a continuation of military service under the *bey*; it was not the case in Morocco where the army was formed of volunteers due to restrictions imposed by the protectorate treaty (Clayton 1988). Yet, in contrast with Algerians, Tunisians and Moroccans were never opened a special access to French citizenship, excepting soldiers with military decorations. Both Tunisia and Morocco almost peacefully obtained their independence in 1956, in the footsteps of Indochina (1954).

In North Africa, European settlers made before WW2 a very large share of urban population, and even after the majority of civil servants; in agriculture they produced wine and grew wheat, barley, oranges, lemons and olives, for export. Yet each of these colonies displayed structural trade deficits, due to consumer goods imports by settlers, financed in particular by metropolitan wage payments to expatriate military forces (see imports and exports to GDP figures in Table 2). Jews of Algeria were granted the French nationality in 1871; this was not the case in Tunisia and Morocco. In 1925, Europeans and Algerian Jews accounted for 8% of total population in the three North African colonies taken as a whole; this share had decreased to 7%

¹⁰ Third Republic: 6 deputies from 1870 to 1875, then 3 1876-1881, 6 again 1882-1927, 9 1928-36, 10 1937-40; 3 senators since 1876 until 1940. Cf. Binoche-Guedra 1988. Fourth Republic: two electoral colleges, one for female and male French citizens (among whom not more than 15% of Muslims were ever found), another for the rest of Algerians (only males), with 15 deputies and 7 senators each. Cf. Ageron 1990, p. 91. Fifth Republic (1958): male and female Muslims get 46 deputies over a total of 67, and 22 senators over 31. Cf. Collot 1987 pp. 16-17, cited by Weil 2005 p. 108.

¹¹ Rivet 2002 pp.136-155. Britain agreed on a French Tunisia as it invaded Egypt at the same time (1882) and remained there until 1956, like France in Tunisia.

¹² Tunisia's colonial history: Rivet 2002, Martin 2003, Chouikha & Gobe 2015. Masri, 2017.

¹³ Rivet 2002 pp. 155-174; on Morocco's indebtedness: Barbe 2016.

¹⁴ Morocco's colonial history: Rivet 2002, Germouni 2015.

in 1955. In Algeria, the non-Muslims, three quarters of whom were French, accounted for 14% of 1925 population, gone down to 10% in 1961. In Tunisia, French and Italian settlers weighted around 7%, while in Morocco, the share of French never went above 5%. Jews in Tunisia were one quarter of non-Muslims; in Morocco they were more than one half in 1925, then more than one third in 1955. Just after the Evian agreements on Algeria independence, 800,000 “*piets-noirs*” (French settlers) fled in mass to the metropolis; in Tunisia and Morocco, the emigration of French settlers started in 1956 and was more gradual, yet at the end of the 1960s most of them also had left, the same for Jews who went either to France or to Israel.

*Indochina*¹⁵

Indochina was composed of five territories that were successively conquered between 1858 and 1899. Cochinchina (South Vietnam) was the first in 1862, and was directly ruled as a colony. Annam (Center Vietnam), Tonkin (North Vietnam), Cambodia, and Laos, were officially protectorates, although the room left to indigenous authorities (kings) was perhaps even more limited than in Tunisia or Morocco; Tonkin was finally managed as a colony.¹⁶ The federal government of Indochina was established in 1897. Federal budgets were mainly financed by trade taxes and were separate from individual colonies budgets financed by direct and indirect internal taxation. Lower layers of administration were provinces (only after 1931 outside of Cochinchina) and municipalities. There were a bit more than 30,000 French people in 1925, including around 10,000 military soldiers, a bit more than 50,000 at the end of the 1940s, with 20,000 soldiers. One half of the French resided in Cochinchina in 1925, two thirds in 1948; the rest was mainly in Tonkin. They never represented more than 0.25% of total population, except in Cochinchina, and even within civil service they were a minority (10 to 15%), although concentrated in highest positions. After 1881, French colonists of Cochinchina were represented at the metropolitan parliament by one deputy. Chinese people made a larger minority, counting around 300,000 people in 1925 and more than 600,000 in 1948, many of them living also in the South. Like in Algeria and Tunisia, a lottery-based military conscription was implemented after WW1 (1923). The French invested in rice production and exports, rubber, tea, pepper and coffee plantations, and in Tonkin exploited coal, zinc and tin mineral resources. Until WW2, Indochina, and in particular Cochinchina, was quite a profitable colony displaying large trade surpluses, in contrast with others. After the short-lived invasion by the Japanese in March 1945, the French lost ground and could not recover control over the North held by communist and independentist forces. Indochina was divided in three “associate States” (Cambodia, Laos and Vietnam) which were granted more autonomy. More than 100,000 soldiers, from the metropolis and African colonies, arrived between 1945 and 1954 to fight the Viet-Minh. French presence in Indochina ended with the defeat of Dien-Bien-Phu in 1954.

*Sub-Saharan Africa (SSA): West and Central Africa (WCA)*¹⁷ and Madagascar¹⁸

¹⁵ Indochina’s colonial history: Brocheux & Hémerly 1994, Brocheux 2009.

¹⁶ The territory of Kouang-Tcheou-Wan at the border of China was occupied since 1899 and retroceded to China in 1945. It is not included in our figures.

¹⁷ French SSA’s colonial history: Suret-Canale 1962; Coquery-Vidrovitch 1974; M’Bokolo 1992; Manning 1998; Almeida-Topor 1999. Economic history of West Africa: Hopkins 1973.

The French had established a trade post in Saint-Louis of Senegal in the middle of the 17th century, then in a few locations on the Atlantic coast, mainly for buying slaves. In the Indian Ocean around Madagascar, France also owned the island of *La Réunion*, then took hold of the other islands of Nosy-Be, Sainte-Marie and Mayotte in the 1840s.¹⁹ The conquest of SSA started with the scramble for Africa in the 1880s and was more or less completed in 1905, except for Cameroon and Togo which came after WW1 from the sharing of two German colonies with Britain. French SSA was composed of four blocks: West Africa (*Afrique Occidentale Française*, or AOF) and Togo, Central Africa (*Afrique Equatoriale Française*, or AEF), French Cameroon and Madagascar.

AOF and AEF were federal structures, whose “general government” were respectively in Dakar and Brazzaville, and were composed respectively of eight and four colonies: Senegal, Mauritania, Soudan – present Mali, Niger, Haute-Volta – present Burkina Faso, Dahomey – present Benin, Cote d’Ivoire and Guinea on the one hand²⁰; Chad, Oubangui-Chari – present Central African Republic, Congo, and Gabon on the other hand. Like in Indochina, federal budgets were mainly financed by trade taxes and were separate (except for AEF 1935-45) from individual colonies’ budgets financed by internal taxation. Some spending and tax decisions were even decentralized at the level of districts (called ‘circles’ in AOF), managed by a French administrator. Togo and Cameroon were ruled by France under a mandate from the League of Nations then United Nations. This made little difference with full-fledge colonies in practice, except that military conscription was precluded; Togo’s administration was very much connected to AOF. Madagascar had its own general governor, and was divided into some twenty provinces all headed by a French administrator; after 1931, eight super-provinces were granted an individual budget, and decentralization went even further after WW2.

Like in Indochina, French colonists were in SSA a small minority; they never represented more than 0.5% of total population in SSA mainland. In Madagascar a larger proportion was met: 0.5 in 1925 to 1.2% in 1955, with in particular settlers coming from neighboring *Réunion* island; there was also a significant Indian minority (0.3% for all Asians). SSA colonies were plantation economies, starting with groundnuts (Senegal and other Sahel colonies mainly), palm kernels and palm oil, wood, Arabic gum; coffee, cocoa, and cotton mainly took off in the 1950s, and oil only came in the late 1960s or 1970s in Congo and Gabon, then Cameroon. Madagascar had quite diversified agricultural exports: cassava, peas, coffee, rice, vanilla, cloves, and tobacco. Trade deficits were the rule, although to a much lesser extent than in North Africa. Under the Third Republic, until 1940, the natives from the “*Quatre Communes*” of Senegal (Dakar, Saint-Louis, Gorée and Rufisque) were considered as French citizens and could send one deputy to the metropolitan parliament. Starting in 1912, improvised conscription brought some 150,000 Africans to Morocco and to the fronts of WW1. After 1920, a lottery-based military conscription applied until 1960 in AOF, AEF and Madagascar, but not in Cameroon or Togo due to treaties. Between 1920 and 1945, fit men not drafted were reservists to be mobilized in wartime, and were also used as a free labor force in public works like railways construction (Fall 1993). Apart from soldiers having won military honors, other indigenous subjects had no privileged access to

¹⁸ Madagascar’s colonial history: Randrianja & Ellis 2009; Fremigacci 2014.

¹⁹ The latter island and the Comoros archipelago were merged with the Madagascar colony in 1912.

²⁰ This is the post-WW1 structure, after the former colony of “Haut-Sénégal-Niger” was split between Soudan, Niger and Haute-Volta. The latter disappeared between 1932 and 1946, being dismantled between Cote d’Ivoire and Niger.

citizenship. Under the Fourth Republic, between 1946 and 1956, like in Algeria indigenous subjects obtained some political representation at the metropolitan parliament, local assemblies, and at the confederative imperial assembly (“*Union Française*”), under a system of suffrage restricted to a heterogeneous list of occupations and social positions, given in particular the limitations of civil registration (Guillemin 1958; Cooper 2014b p. 137-138). In 1956, the so-called “*loi cadre*” granted universal suffrage to male and female Autochthons, suppressed segregation of electoral colleges, and gave large autonomy in government to territorial assemblies. Then between 1958 (Guinea) and 1960, all Sub-Saharan territories became independent countries, rather peacefully on the whole. The 1947 insurrection in Madagascar and the war against UPC in Cameroon (1955-62) make the two major exceptions to this rule.

Initial conditions

According to our rough demographic estimates, with around 9.0 millions of people in 1850 North Africa (NA) was the least populated area (22% of total), while Indochina and Sub-Saharan Africa (SSA) respectively counted 14.2 (35%) and 17.7 (43%) millions. Population shares changed little across the colonial period.

Table 1 – Estimates of population and GDP per capita for the year 1850

	France	Empire	NA			Indochina			SSA		
			Algeria	Tunis.	Mor.	Coch.	Oth.	Madag.	AOF	WCA	
									AEF	Cam.	
Population ^a	36.2	40.2	4.2	1.3	3.4	1.0	13.2	2.2	9.3	3.5	2.4
				9.0			14.2			15.2	
Urbanization (%)	26.0	2.5	4.8	9.6	7.7	5.1	1.1	2.2	0.9	0.6	0.0
				6.6			1.4			0.7	
GDP per capita ^b	3,793	532	944	821	726	862	371	581	465	429	482
			844			406			464		

a: millions; b: francs 1937, PPP

Sources and methodology: Metropolitan France: GDP at market prices from INSEE annual national accounts 1949-2010; from 1949 to 1900, extrapolated backward using annual growth rates for market GDP estimated by Pierre Villa (1997) while taking into account the gradual increase of the share of non-market GDP using estimates of this share from Vincent (1972, p. 334) for 1913, 1929 and 1938; from 1900 to 1820, retroplated backward using annual growth rates estimated by Toutain (1987). Urbanization data are from Eggiman (1999) and Chandler (1987). Population and GDP data for colonies: see data appendix.

Then, according to even rougher estimates of PPP GDP per capita, NA was twice wealthier than Indochina and SSA in 1850.

Algeria comes out as the wealthiest colony, yet it is the one who in 1850 had already endured 20 years of French colonialism; figures for 1850 are then contaminated by the presence of some 125,000 European civilian settlers (60,000 French; 3% of total population) plus 110,000 army men, larger public expenditures, etc. Backward extrapolation to 1830 would lead to a figure around 700, not far from its two neighbors in Maghreb. Within Indochina, extreme South Vietnam (Cochinchina) is estimated to be twice richer than the other parts, putting it at par with North Africa. Within Sub-Saharan Africa, Madagascar ranks first.

These gaps in GDP per capita fit with our prior that North Africa benefited from its millennial integration in the Mediterranean economy, and from its connections with the Islamic world and the Ottoman Empire (Valensi 1969). The contrast with WCA also fits with differences in urbanization rates or population density. In Indochina, the Nguyen dynasty had extended its imperial rule over the whole Indochina during the 19th century, and had its capital city (Hue) in Central Vietnam (Annam), counting perhaps around 50,000 people, as well as Hanoi in the North (Tonkin). Yet the Mekong delta in the extreme South benefited from superior ecological conditions for rice cultivation, and had already attracted a pretty large Chinese immigration (Bassino, Giacometti & Odaka 2010). In the 19th century, the whole Madagascar island had been almost united by the kings of *Imerina* (highlands around the capital city Antananarivo; Campbell 2005). In the parts of WCA that the French conquered, the three most salient political structures of the 19th century were probably the Dahomey kingdom in present-day Benin (Polanyi 1966; Almeida-Topor 1995), the Toucouleur empire of El Hadj Omar Tall in Senegal and Mali, and the moving empire of Samory Ture from forest Guinea to Northern Cote d'Ivoire and Ghana, all of which required some military effort to be defeated. The two places outside North Africa where more French colonists could be found were also *ex ante* the wealthiest and the most urbanized, Cochinchina and Madagascar.²¹

2. Data construction

Our analysis relies on the collection of first-hand data in French colonial archives. Extraction compilation, homogenization, cleaning and cross-checking took years. For details we refer the interested reader to the large data appendix.

Over the 1830 to 1962 time period, we collected detailed public finance data on revenue and expenditure for all colonies of the “second French” colonial Empire. Collection methodology was designed to get homogeneously defined spending and tax headings. Data at the general government layer (federative or not) are annual; this allows us to precisely measure civilian transfers received from the metropolis. Metropolitan budgets of the two ministries of Navy/Colonies/Overseas and of War/Defense (NA and Indochina War) provide military expenditure and our collection distinguishes spending on health and infrastructure from personnel and operational expenses of troops.

Data on lower layers of administration, colonies, provinces, regions or departments, are triannual. Municipal budgets were also collected when found. Auxiliary budgets for the allocation of funds from loans, for medical assistance or for posts and telegraphs were also collected. Our net revenue and net expenditure variables are consolidated to avoid double-counts arising from transfers between administrative layers.

Public wages and employment in each colony and administrative sector were also collected for the years 1913, 1925, 1937, 1949, 1955 and 1960.

For the transition period to independence and until 1970, we also extracted budgetary data from the franc zone reports, and linked them with colonial accounts.

²¹ For the year 1937, data on wages paid to unskilled (indigenous) laborers fit with our estimates of GDP per worker (15+ y.o. population), in that these minimum urban wages are not too far (and in most cases above) the GDP per worker. Tonkin makes the most salient exception, average unskilled wages being more than twice our GDP per worker estimate. It might be that Bassino's estimates for Tonkin are too pessimistic, if only for the year 1937 following the Great Depression.

Development outcomes or policy variables like school enrollment, health personnel, electricity output, roads or railways length, international trade, were extracted from statistical annals.

Population series draw from Frankema and Jerven (2014) and other sources like population censuses and World Bank, and correct for obvious mistakes like the absence of a demographic shock in the World Bank series in 1962 Algeria when 800,000 French settlers left. Territorial extension of population, due to colonial conquest or changes in boundaries, is thoroughly scrutinized.

Two specific data collections were devoted to consumer prices indexes on the one hand, and to price levels on the other hand. This allowed us to compute a Purchasing Power Parity index for the year 1937 and to build colony-specific price indexes.

Finally, a special effort was dedicated to devise our own estimates of GDP for France and each colonial territory. For NA and SSA, these estimates are obtained by backward extrapolation using 1950s national accounts and real growth estimates by Samir Amin (NA) and Angus Maddison (NA & SSA). For Indochina, we draw from nominal GDP figures provided by Jean-Pascal Bassino, and use our own price deflator.

3. A rather high, adaptive and increasing fiscal extraction

A sizeable colonial state

Table 2 provides descriptive figures on the size of the colonial state in each region, for the years 1925 and 1955. Comparisons are also made with the metropolitan State, and with year 2010. 1925 is a year when (i) the second colonial Empire has reached its largest extension with the inclusion of Morocco in 1913 and Cameroon and Togo in 1920; (ii) the French civilian administration has replaced the military, has implemented indigenous conscription almost everywhere, and is able to draw stable fiscal revenues from the colonial economy. In 1955, Indochina has already set free, Tunisia and Morocco are about to get their independence and post-WW2 development plans are run both in NA and in SSA.

In 1925, the total fiscal revenue collected by central and upper-tier local administrations reached 8.6% of GDP in the Empire as a whole, half of the metropolitan figure (17.5). Fiscal extraction was not ridiculously low in the colonies. It was just the same as the metropolis in 1870 [check]. National government tax revenue ranged between 6 and 8% of GDP in 1930 Argentina, Brazil and Mexico (Sokoloff and Zolt 2007, p. 123). For the same variable, the French Empire just stands at 5.8%, i.e. at the bottom of the Latin American interval. Metropolitan France spent some 3% of GDP in debt service, and 5% in the army. Colonies did borrow yet did not pay for military expenditures, and under the doctrine of self-financing that applied until WW2, their capacity to levy taxes directly determined their capacity to spend and to reimburse their loans. At the end of the day, civilian expenditures to GDP were close: 6.7% in France against 7.6 in the Empire; municipal expenditures push the metropolitan figure higher, at 10.1%, whereas among colonies they only matter for Algeria (8.2%). Of course, as France is nine times richer than its Empire, when measured in per capita terms the size of the metropolitan State is eleven times larger. If military expenditures are added this ratio gets even higher, as those directly allocated to

the colonies, in particular through conscription, represent only a tiny share of the money spent by France for the defense of the metropolitan territory and for its imperial projection.²²

Between 1925 and 1955, state size tremendously increased both in the Empire and in France. The exception was Indochina where after WW2 the French colonial state could not resume its control; the last data point is for 1953 and shows a decrease in fiscal capacity and in public spending (as well as a collapse of rice exports). Revenue to GDP went from 8.6 to 14.7% and from 17.5 to 29.0% respectively (when Indochina is counted apart). Figure 2 depicts the evolution of this indicator across time in each colonial territory. It went down during the two world wars, and then dramatically peaked in the 1950s both in NA and WCA. Madagascar also stands as an exception with its rather stationary profile. Independence years (1956, 1960, 1962) create an air pocket due to administrative disorganization, yet fiscal revenue quickly recovers afterwards, back to the 1955 level. In 1955, colonial fiscal extraction is again half of metropolitan.

Strikingly enough, Latin American comparators are then lagging behind, between 7 and 10%, while in French colonies central government tax revenue reaches 11% of GDP. In France public expenditures have risen to almost 30% of GDP and in colonies they stand much above fiscal revenue, at 21%, thanks to large transfers from the metropolis (see section 5 below).²³

In 2010, the states of the former French Empire are collecting as much revenue as 26% of their GDP, in which the oil and mining sectors bring a very significant fraction (Table 2, bottom panel). Yet fiscal extraction on the rest of the economy is also higher on average than in 1955, slightly above 20%. All the increase is driven by North African countries, while Madagascar has regressed and West and Central African countries have little progressed.

The right part of table 2 also informs about the heterogeneity within the colonial Empire. In terms of revenue to GDP, the variance is in fact rather limited, in 1925 and even more so in 1955. Perhaps surprisingly, Indochina²⁴ and Madagascar are the colonies where fiscal pressure is highest (above 10%) in 1925, while WCA more expectedly lags behind (5.8%), because of AEF (3.5%) and newly acquired Cameroon (3.1%); NA settler colonies stand in the middle with rates ranging from 7 (Algeria) to 9% (Morocco). Given this, higher expenditures per capita in NA mostly result from higher wealth, not higher taxation. In 1925, they are two to three times larger compared to Indochina or Madagascar, and fivefold compared to SSA.²⁵ In 1955, WCA has impressively caught up with NA and Madagascar in terms of fiscal extraction. Most territories then lie in a narrow enough interval from 12% of GDP (AEF) to 17% (Algeria), except small

²² In 1925 NA, the figure (128) is impacted by the War of the Rif. The 1955 figure (159) is also affected by the beginning of the war in Algeria.

²³ The expenditure gap would of course look much wider if we were including welfare expenditures like pensions or health insurance, whose weight increased a lot after WW2 in the metropolis, and only marginally for settlers in NA; the metropolitan figure would then climb to 42% [check].

²⁴ Indochina is rather close to the figure provided by Booth (2007) for colonial Burma (11.3% of NDP in 1926-7).

²⁵ These results are broadly in line with those of Frankema (2010) on British colonies for 1911-1937. Tax incidence is much higher in the metropolis, be it UK or France, than in any colony, even including the dominions Canada, Australia or New-Zealand where European descent settlers form the majority of population. Likewise, all “partial settlement” colonies, North Africa, South Africa, Southern Rhodesia or Mauritius, levy more taxes on a per capita basis than non-settler colonies. We differ in the way we make a correction for income: we use (very coarse) GDP estimates, where Frankema uses reported average wage for urban unskilled male workers; urban wages can imperfectly correlate indigenous income if the level of wage dualism varies, depending in particular on settlers’ presence. Yet, in both cases, differences are much reduced, and we find that Algeria did not tax more than French West Africa but more than French Central Africa, while Frankema finds that South Africa ranked below the richest non-settler colonies like Gold Coast or Kenya, but much above the very populated Nigeria.

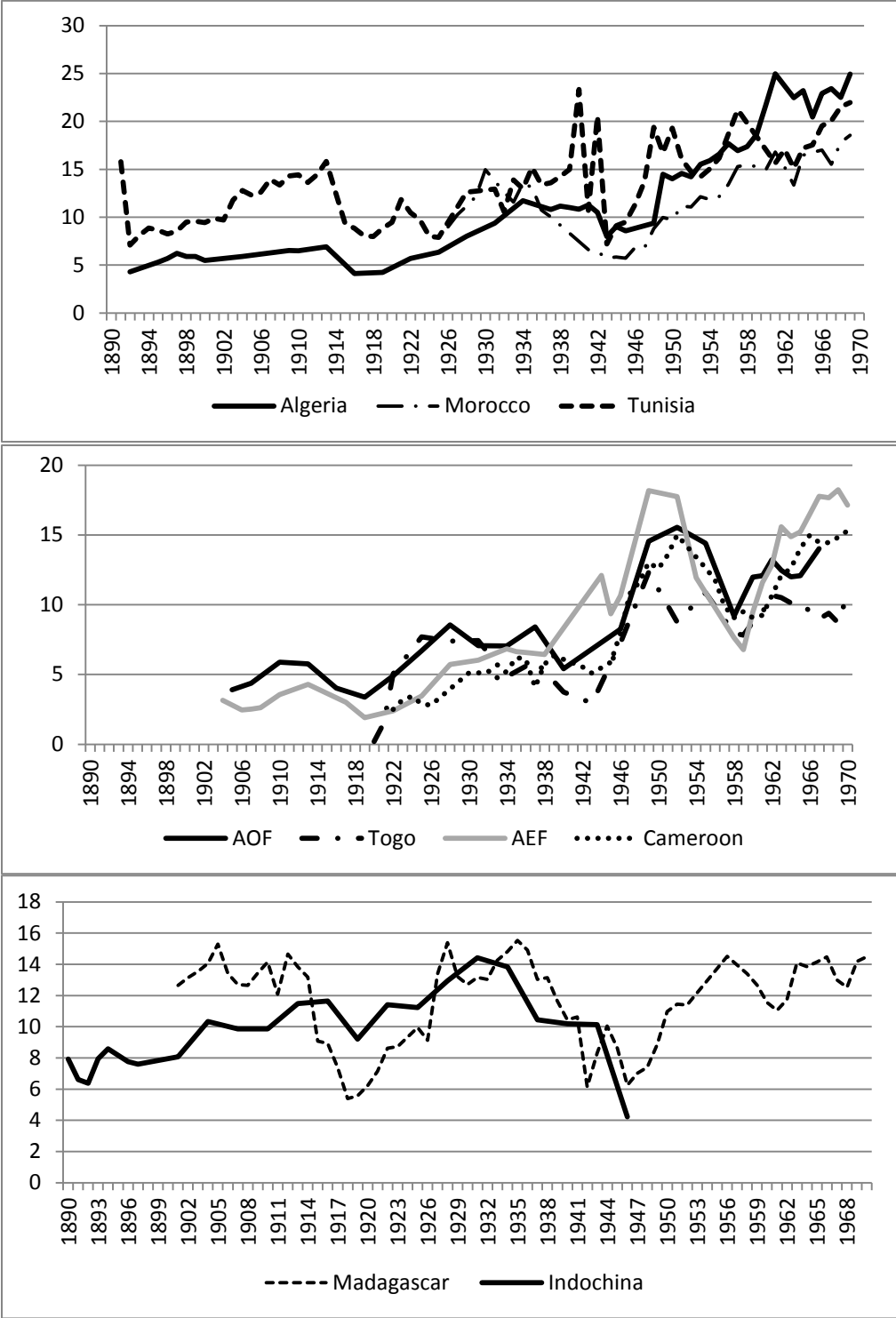
Togo at 10%. WCA also slightly converged in terms of income per capita, thanks to the post-war export commodities boom (Berthélemy 1980 on AOF and Togo).

Table 2 – Fiscal extraction and state size across the French Empire in 1925, 1955 and 2010

	<u>Metropolis</u>	<u>Empire*</u>	<u>NA</u>	<u>Indoch.*</u>	<u>Madag.</u>	<u>WCA</u>
Year 1925						
Population (millions)	40.61	64.51	13.67	26.06	3.57	21.27
GDP per capita (1937 FF)	7,765	828	1,876	632	693	552
Share of Europeans (%)		1.9	8.1	0.1	0.5	0.1
Imports/GDP (%)	20.4	24.6	32.4	15.4	32.4 ^a	18.3
Exports/GDP (%)	21.1	20.7	21.8	21.6	29.3 ^a	14.8
Revenue / GDP (%) w/o municipalities	17.5	8.6	7.5 ^b	12.4	9.9	5.8
Central government Tax Revenue / GDP (%)	13.0	5.8	4.8 ^b	7.6	8.4	5.2
Civilian Expenditures / GDP (%)	6.7	7.6	7.1 ^b	10.8	8.3	4.6
Estimates with municipalities	10.1	8.2	8.1 ^b	10.9	8.3	4.8
Civilian expenditures per capita (1937 FF)	524	63	133 ^b	68	57	25
Estimate with municipalities	783	68	152 ^b	69	57	26
Metropolitan military exp. per cap. (1937 FF)	373	34	128	11	13	6
Year 1955						
Population (millions)	43.43	61.26	22.36	34.58	4.92	34.01
GDP per capita (1937 FF)	11,938	1,476	2,399	477	1,118	922
Share of Europeans (%)		2.9	7.0	0.15	1.2	0.4
Imports/GDP (%)	11.9	25.4	28.3	16.9	18.6	18.9
Exports/GDP (%)	12.2	18.6	19.8	4.1	13.1	16.0
Revenue / GDP (%) w/o municipalities	29.0	14.7	15.2	9.4	14.6 ^c	13.9 ^d
Central government Tax Revenue / GDP (%)	25.0	10.9	10.5	7.1	6.8 ^c	12.4 ^d
Civilian expenditures / GDP (%)	25.7	18.8	19.9	7.0	18.8 ^c	16.7 ^d
Estimates with municipalities	29.8	20.9	23.5	7.6	18.8 ^c	16.7 ^d
Civilian expenditures per capita (1937 FF)	3,070	277	479	33	210 ^c	154 ^d
Estimate with municipalities	3,554	308	564	36	210 ^c	154 ^d
Metropolitan military exp. per cap. (1937 FF)	1 144	80	168	123	53	26
Year 2010						
Population (millions)	65.03	357.46	78.67	107.69	21.08	150.01
GDP per capita (1937 FF)	46,807	2,840	7,136	2,240	720	1,318
Revenue / GDP (%)	25.2	26.3	31.6	22.7	11.2	18.8
Revenue / GDP (%), non-mineral	25.2	20.6	22.1	21.7	11.2	15.3
Tax Revenue / GDP (%), non-mineral	25.2	18.0	19.6	19.3	9.2	13.8

Notes: *: 1955: Empire average is without Indochina. Data on Indochina is 1953 (except PMS region 1954); a: 1926; b: Morocco 1926; c: 1956; d: AEF =1954.

Figure 1 – Fiscal revenue to GDP from 1890 to 1970



Notes: Revenue to GDP with provincial and departmental revenue included, but not municipal revenue.

Colonial fiscal capacity was in most regions not too low since the beginning. Furthermore, colonial administrations managed to double fiscal extraction between 1925 and 1955, especially in the first decade after WW2. We now describe how they adapted the tax structure to contexts and historical periods.

Fiscal adaptation across space and time

Detailed data on public revenue allowed us to reliably categorize taxes from the most archaic to the most modern, i.e. from tools involving only light administrative management like head tax (*capitation*) or monopolies (salt, opium, tobacco, alcohol, post and telegraph, registration fees, land rents, etc.) to taxes demanding up-to-date registers and/or detailed observation like income, turnover or large spectrum transaction taxes, going through taxes on external trade and a whole range of intermediate tools like excise taxes. Unsurprisingly the tax structure of the metropolitan state is by far the most “modern”. As early as in 1925, monopolies only provide 13.3% of total revenue, while direct and indirect “modern” taxes on income or production bring 31.5% (Table 3, column 1). In 1955, the metropolitan tax structure has further modernized, as the latter share reaches 53.5%.

Table 3 – Tax structure 1925 and 1955

	<u>Metropolis</u>	<u>Empire*</u>	<u>NA</u>	<u>Indoch.*</u>	<u>Madag.</u>	<u>WCA</u>
Year 1925						
Capitation	0.0	11.3	1.1	13.1	32.4	27.4
Monopolies	13.3	28.7	31.2	34.1	15.5	10.0
Intermediate & Other	49.7	35.1	34.8	39.5	26.7	26.4
Trade	5.5	17.9	16.7	12.0	25.4	36.1
Modern direct & indirect	31.5	7.1	16.3	1.3	0.0	0.1
	100.0	100.0	100.0	100.0	100.0	100.0
Year 1955						
Capitation	0.0	5.7	0.0	0.4	17.6 ^a	14.2 ^b
Monopolies	7.5	20.7	26.5	21.0	14.6 ^a	10.8 ^b
Intermediate & Other	30.8	37.7	31.1	36.4	18.3 ^a	23.3 ^b
Trade	8.2	21.5	9.6	38.0	37.2 ^a	41.0 ^b
Modern direct & indirect	53.5	24.3	32.7	4.2	12.3 ^a	10.7 ^b
	100.0	100.0	100.0	100.0	100.0	100.0

Notes: Capitation includes taxes on cattle. *: 1955: Empire average is without Indochina. Data on Indochina is 1953 (except PMS region 1954); a: 1956; b: AEF = 1954.

Within the Empire, the North-African tax structure is the closest to the metropolitan, relying for 16.3% on modern taxes in 1925. Algeria first, then Tunisia had gradually adopted a copy of taxes existing in metropolitan France, in particular direct taxes on wages, benefits, income from personal property, real estates, trading licenses, as well as a general income tax that came on top in 1919 Algeria and 1928 Tunisia. “Modernization” also meant suppressing or decreasing the weight of traditional taxes that were a legacy of the Ottoman period: the so-called “Arab taxes”

disappeared in 1919 Algeria (Todd 2009), while in Tunisia the product of *ad valorem* taxes on income drawn from agricultural exports (olives, cereals, wine, etc.) gradually overcame the product of ancient taxes on palm or fruit trees, land for vegetable farming or cattle (Nicolai 1962, p.443). Morocco started this modernization process later, as it fell late under colonial rule, and did not receive as many settlers overall. The tax on agricultural income called “*tertib*”, a reformation of disparate precolonial taxes initially introduced by sultan Moulay Abdelaziz in 1901 then withdrawn, made the bulk of direct tax revenue until the end of 1940s, after which its share gradually declined to one third in 1955. As for taxation of trade, Algeria, and Tunisia with a few exceptions, formed a custom union with metropolitan France, so that neither imports from France nor exports to France were taxed; only dock dues (“*octroi de mer*”) applied as they applied to other origins. In contrast, because of treaties signed in 1911 regulating the protectorate, in Morocco French imports had to be taxed at the same rate as other nations; this impediment was gradually circumvented through excises on imported goods. As everywhere in the Empire, import tariffs were raised in Tunisia and Morocco during the Great Depression and WW2 then went down only slightly after 1946. Table 4 breaks down the 1925-1955 variation in revenue to GDP into tax types, and shows that “modern” taxes are responsible for half of the increase in fiscal extraction over the three decades (3.8 percentage points over a total variation of 7.7).

Table 4 – Fiscal modernization between 1925 and 1955

	NA	Madagascar	WCA
Variation in revenue to GDP 1925-1955 ^a	+7.7	+4.6	+8.1
Capitation	-0.1	-0.7	+0.4
Monopolies	+1.7	+0.6	+0.9
Intermediate & Other Resources	+2.2	+0.0	+1.5
Import taxes	+0.2	+2.6	+2.2
Export taxes	+0.0	+0.3	+1.4
Modern direct & indirect	+3.8	+1.8	+1.5
Import taxes with constant import share ^b	+0.4	+4.7	+1.8
Export taxes with constant export share ^b	+0.0	+1.0	+1.4

a: in percentage points. Madagascar = 1925-1956; AEF = 1925-1954.

b: computed as $(\tau_{1955} - \tau_{1925}) \left(\frac{S_{1925} + S_{1955}}{2} \right)$, where τ is the average tax rate on imports (resp. exports) and S is the share of imports (resp. exports) in GDP.

The other areas, Indochina, Madagascar and WCA, display rather similar structures in 1925, in that they relied more on *Ancien Régime* taxation, capitation and monopolies.

In Indochina monopolies of opium, imported alcohol and salt brought alone 25% of total revenue, while taxes on local alcohol, tobacco and mineral oil brought an additional 10%. Opium was ‘deliberately a Chinese tax’, as it was purchased mainly by wealthy ethnic Chinese, although it gradually extended to Indochinese urbanites (Bassino 2000 p. 281). Like in NA, taxation of trade was limited by the custom union prevailing with metropolitan France. Among local governments, the small but wealthy Cochinchina, where many of the French and Chinese were found,

contributed more than other territories, to the benefit of poorer Tonkin and Annam as there was some resource pooling organized by the general government (Bassino 2000 pp. 279-80). Local governments drew the bulk of their resources from direct taxation, mainly the head tax on autochthons, the land tax on paddy fields which mainly weighted on them, and trading licenses more or less equally shared with settlers.²⁶ A minimal lump-sum tax based on twelve income brackets and a wage tax had been in place since 1920, then a general income tax was introduced between 1938 and 1941 and extended to Chinese and Indochinese, yet Europeans were not enough to generate large revenue. According to our estimates drawing from income tax data, the average European was five times richer than in NA, and Europeans earned around 9% of total national income while being not more than 0.12% of population (Appendix 1). The budget of Indochina could not afford relying on the taxation of this tiny European enclave, as wealthy as it was. This structural feature is the main explanation for the archaic taxes that were implemented.

Madagascar and WCA relied very much on capitation, a head tax that was paid for every individual except children (with varying minimum age thresholds), and oldsters and physically impaired; civil servants and military soldiers were also exempted. The lump-sum amount could vary across colonies and even districts. In 1925 WCA, capitation alone weighted 27% over 37% when adding revenue from state monopolies. In Madagascar, it brought 26% of total revenue; the tax on cattle brought another 6% and revenue from public monopolies and state-owned land counted for 16%, putting “old-style” taxes share at a very high 48%. Since the very beginning of 20th century, capitation rates had been set at much higher levels in Madagascar (Jacob 1987) compared to WCA (Cocquery-Vidrovitch 1968 & 1972). This, and secondarily the cattle tax and monopolies, explains why tax revenue in the former was almost twice the level raised in the latter.

Corvée labor from the so-called “*prestations*” system set in 1912/15 SSA represented an in-kind taxation, which came in addition to using conscription reservists in public works (Fall 1993). Our figures do not include monetary equivalents of these labor payments, except when they were rebought in cash. Marlous van Waijenburg translates *corvée* labor days into francs using unskilled labor minimum wages. She finds that in 1925 *corvée* labor meant a 9 to 71% addition to individual colonies’ revenue; when weighted by colonies’ budgets²⁷ the average increase is 20% for WCA, i.e. a lower amount than capitation (27%) (van Waijenburg 2018). Taking into account this upper bound estimate would raise our share of “capitation + *corvée*” to $(.27+.20)/(1+.20) = 39\%$ in WCA. In Madagascar, the colonizer had rather made the choice to set high capitation rates²⁸, so that *corvée* labor only brought an additional 11% of revenue, bringing the share of “capitation + *corvée*” to exactly the same level.²⁹

Taxes on trade represented a quarter of tax revenue in Madagascar, and the highest share overall in SSA (36%). Madagascar had a custom union with metropolitan France, so that duties were limited, yet the consumption of a few imported goods was taxed, and exports were taxed. In the rest of SSA, import tariffs could be fixed according to domestic conditions and

²⁶ Gouv. Gal de l’Indochine, 1931. *Annuaire Statistique de l’Indochine, deuxième volume, 1923-1929*, Hanoi : Imprimerie d’Extrême Orient, pp. 311 (Annam) & 327 (Tonkin).

²⁷ From Frankema & van Waijenburg 2014, Table 2, p 383. For reasons explained thereafter we do not think that these individual colonies budgets are properly reconstituted, yet the federal average should fit.

²⁸ In order to break with the very unpopular intensive forced labor practices of the precolonial *Merina* kingdom, see Jacob 1987 and Campbell 2005. In counterpart, conscription reservists (the so-called SMOTIG, *Service de la Main-d’Œuvre des Travaux Publics d’Intérêt Général*) were used intensively between 1928 and 1945 (Fremigacci 2014 p. 50); they are not counted in Waijenburg’s estimates.

²⁹ For 1913/15, the contribution of *corvée* labor was much higher, the SSA average figure from van Waijenburg being 43%. For 1934, one gets a figure close to the one of 1925. In 1946, forced labor was outlawed in French colonies.

circumstances, even if the general principle of favoring or exempting French imports also prevailed, except that treaties imposed limitations for Côte d'Ivoire and Dahomey in AOF, and for all colonies in AEF except Gabon (Congo River Basin) (Bernard 1913; Naudin 1929; Cornevin 1972 pp. 294-295). Trade taxes were most often raised at harbors whatever the final destination within the Federation, so that imports and exports of landlocked colonies, and revenue from them are strongly underestimated in administrative records.³⁰ Hence it is not straightforward to reallocate federal revenue to individual colonies and to assess federal redistribution. Although coastal colonies had most likely (but gradually) turned more buoyant than landlocked, granting them all custom duties collected in harbors leads to overstating their tax revenue and understating the share of head tax in this revenue, so that the negative correlation between the share of direct taxes and total public revenue should be smaller than the one found by Frankema and van Waijenburg (2014, pp. 384-386). Yet, within French SSA, it is still true that in 1925 AOF collected twice the tax revenue of AEF, whether in capita or in GDP terms, and at the same time depended less on capitation (or on monopolies); the same is true when comparing Togo to Cameroon.³¹ Hence what is salient is a West/Central contrast, similar to the West/East one that Frankema (2011), and Frankema and van Waijenburg (2012 & 2014), reveal among British colonies, rather than a coastal vs. landlocked contrast. This contrast was most likely due to (i) a higher initial extraversion of West Africa dating perhaps from the time of 'legitimate commerce' (Law 1995); (ii) above mentioned differences in international trade agreements applying to each territory. This contrast actually vanished at the end of 1930s (see Figure 1, middle panel) and was no longer visible in 1955: all areas in SSA were then displaying the same fiscal revenue and very close tax structures; GDP estimates by the French administration in 1953 ranked AOF above AEF, but Cameroon much above Togo.³²

Between 1925 and 1955, a significant modernization of the tax structure also occurred in Madagascar and WCA: the share of capitation and monopolies declined to 32% in the former, to 23% in the latter while the one of modern taxes shifted from 0 to 11-12%. In colonies like Senegal, which were wealthier than average and where French colonists were settled in larger numbers, the income tax introduced in the 1930s began to raise more revenue than capitation, and the turnover tax almost as much. Yet the extent of this modernization was more limited than in NA. At the same time the share of trade taxes increased dramatically. As shown in Table 4, in WCA (especially AOF and Cameroon), this was mainly the result of a rise in the average tax rate on imports (while the share on imports on GDP stayed roughly constant), combined with the rise in the tax rate on cash crop exports.

In 1953 Indochina, the French grip had gotten much weaker, the autonomous government of Vietnam had suppressed capitation and monopolies revenue had lost weight, yet modern taxes had little progressed. In a context where the colonial state was losing ground, trade taxation had become the dominant source of revenue, with a 38% share against (12% in 1925).

³⁰ As acknowledged in: Gouv. Gal de l'AOF, *Budget Général Année 1925*, Gorée : Imprimerie du G. Gal, p. xx-xxi.

³¹ Figures not shown in the tables. Fiscal revenue in 1925 per capita (FF 1937 PPP)/per GDP (%): AOF = 37/6.7; Togo = 46/7.7; AEF = 18/3.5; Cameroon = 17/3.1. In 1955: AOF = 137/14.5; Togo = 84/10.0; AEF (1954) = 92/11.9; Cameroon = 134/13.4.

³² GDP per capita in 1955 (FF 1937 PPP): AOF = 940; Togo = 835; AEF = 788; Cameroon = 1001. Immediate post-WW2 estimates for 1947 are closer to each other.

Increasing progressivity in taxation?

Our data do not allow conducting a precise incidence analysis. In settlement colonies of NA, Europeans and Jews for sure paid a large share of the tax bill, given their weight in total income. They paid a disproportionate share of the direct taxes in Algeria and in Tunisia³³; less in Morocco, because of the agriculture tax mentioned above. They also paid quite a lot of the taxes on imported consumer goods, alcohols in particular. Generally speaking, most of the modernized taxation apparatus applied to a formal sector built around the settlers' enclave, so that Europeans also paid a large share of turnover taxes and of registration fees.³⁴ Anyway, as seen in Figure 1, it does not seem that tax collection collapsed after independence when the majority of Europeans left these countries. This was most likely obtained through a quick replacement of settlers by Autochthons in "formal" salaried and non-salaried positions, involving large recruitment in civil service and army and shifts in capital or land property, and through an increase in tax rates. In contrast to NA, in Indochina, Madagascar and WCA, Autochthons were bound to pay the majority of the tax bill. This however does not tell us how much each group was taxed in proportion of its own income.

Appendix 1 shows tentative estimates for the income shares of Europeans and Autochthons, using novel data from income tax tabulations (Alvaredo, Cogneau & Piketty 2017). We also tried to break down the autochthonous population into "urban and rural non-poor" and "rural poor", in order to simulate more easily the distribution of the tax burden. Specifically, the rural poor are assumed to be taxed mainly via capitation and agricultural exports, and in Morocco by the *tertib*; the non-poor are assumed to pay the same tax rate as Europeans in proportion of their income - with the only exception of capitation. Given this, the overall tax rate on income is bound to be higher for Europeans than for Autochthons.

Our estimate for 1925 NA is a 2.7 percentage points difference: 8.9 against 6.2%. Given the large gap in average income, taxation is very little progressive. Autochthons are estimated to pay at most 38% of the total tax bill. For Algeria only, Ageron (1990 p. 66) estimates this share to 47% before WW1, and to 27% after the suppression of Arab taxes in 1919; we find almost the same figure (28%) for 1925 Algeria. In other colonies, our estimates suggest that Europeans were taxed higher than in NA, from around 12% in Madagascar and WCA to 24% in Indochina; this could reflect that they had less political voice there. Yet this did not mean that Autochthons were less taxed, as their own tax rates range between 5 (WCA) and 11 % (Indochina); taking into account the *corvée* in WCA would put the autochthonous tax rate above the NA level. At the end of the day, Autochthons were probably less taxed in Algeria than in Morocco, slightly less taxed in NA settlers' colonies than in others, and more taxed in Indochina and Madagascar than everywhere else.

After WW2, the modernization of the tax system should have improved its progressivity along the racial line, as the formal sector increased its contribution. Yet, at the same time more Autochthons began to live in cities, got wage jobs, and consumed formal goods, so that the shift in progressivity could be more ambiguous. According to our estimates, in 1955 the respective contributions of Europeans and Autochthons had turned rather homogeneous across colonies:

³³ In 1955 Tunisia, Europeans represented 75% of income tax payers, and the remaining 25% were perhaps overwhelmingly paid by Jews (Alvaredo, Cogneau & Piketty 2017). See also Nicolai 1962 pp. 447-450.

³⁴ For 1956 Tunisia, Nicolai estimates that indirect taxes paid by Europeans could be more than 50% of total indirect tax revenue (Nicolai 1962, p. 453).

Europeans would have been taxed for 20-24% of their income, when Autochthons disbursed around 12%. The ratios of before tax to after tax income indicate a rather tenuous increase in progressivity along the racial line. However, modernization also implied more progressivity among Autochthons, as taxing more imports, incomes, and generally the formal sector meant that the richest Autochthons contributed more. This latter conclusion is much less ambiguous than the former.

In sum, the French colonial states managed from the start to extract significant fiscal resources, by taxing sometimes rather heavily the Autochthons. As time went, and especially after WW2, they succeeded in doubling extraction while shifting to more modern tax systems with better distributive properties.³⁵ However, this extractive efficiency of the colonial state did not come with productive efficiency, neither with fairness, as we are going to see in the next section by examining expenditures.

4. The true nature and legacy of the colonial state: bias and costs

The true limitation of the colonial State was its very colonial nature. It basically meant that expenditure was biased and costly.

Biased expenditures

On the biasedness side, it had to serve first the interests of French colonists and capitalists, by favoring costly investments in railways and harbors to connect mines and plantations, but also by providing settlers with urban public services at metropolitan standards (education, health assistance, electricity).

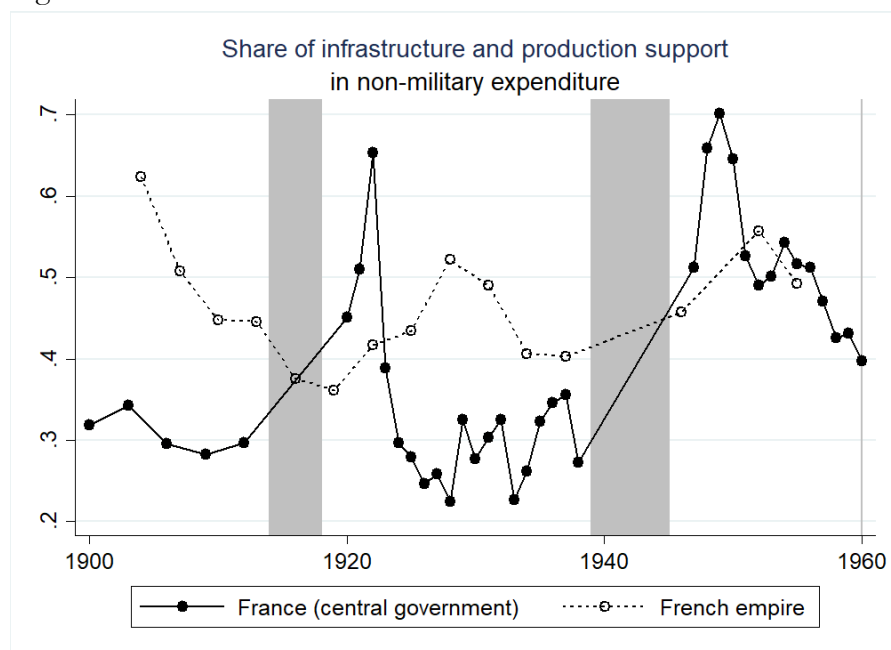
Tables 7 provide a few elements on the structure of expenditures by sector, for 1925 and 1955. Here again, budgets' data collection, homogenization and aggregation were organized in order to make expenditure headings comparable across space and time.

In all colonies, a large share (33 to 49%) of public expenditures went to infrastructure, in particular transportation, and to what we call support "production support", like post and telegraph or transfers to concessionary companies. A large fraction went in particular to railways, in the form of subsidies to private companies in the first place, in direct investment financed by loans or in buying back the private capital, then in subsidies to the operating national company. The only exception to this rule was post-1945 Indochina, where warfare prevented large scale infrastructure projects which were only reaching a 24% share in 1953.

As Figure 2 shows, the dates of 1925 and 1955 are not very representative of metropolitan spending, as reconstruction efforts after the two World Wars were then absorbing large public investments. Before WW1 or during the 1930s, the share of this type of expenditures was much higher in the colonies compared to metropolis. Yet, despite some catch-up between 1925 and 1955, the gap between the metropolis and the colonies remained huge in terms of electricity output, roads and railways. Indochina was particularly lagging behind (data for 1943).

³⁵ It seems that the consolidation of the fiscal apparatus also went with a strong decrease in the time volatility of tax revenue, see Andersson, 2018, paper II.

Figure 2



Railway companies were a favorite investment of colonial capitalists, as it was secured and subsidized by public money. The drawing of railways, main roads and harbors were meant to help the routing of mines' and plantations' outputs. Further, especially before WW2, public subsidies were also directed to the settlement of French farmers in NA, or to colonial societies in SSA or Indochina. Rural roads, small scale irrigation projects, input access and agricultural extension benefitting autochthonous smallholders were not prioritized. NA colonies received more electricity but did not end up better endowed than others with roads or railway lines, because settlers lived in cities.³⁶ Agricultural investments remained concentrated in regions with high potential and a significant presence of European farmers or traders, like the groundnut basin in Senegal, the Office du Niger for cotton and rice in Soudan, or the rice-producing Mekong delta in Cochinchina.³⁷ However biased they were, and despite high investment and operating costs, infrastructure investments were still transformative. In particular, railway lines and major roads stimulated autochthonous initiatives in cash crops, and spurred the growth of larger and wealthier cities (Jedwab & Moradi, 2016; Jedwab, Kerby & Moradi, 2017).

The shares of education in both expenditures and employment were higher in the metropolis, where they respectively reached 20 and 32% in 1925, then 14 and 35% in 1955³⁸; corresponding figures in the Empire were 8 and 13%, then 11 and 18% (see Table 7 for shares in expenditures). According to aggregate figures, NA colonies seem to have exerted a larger educational effort than others, especially Algeria which spent 11-12% in both years and where

³⁶ The metropolitan average is perhaps not the best comparator, if only to assess the post-WW2 infrastructure effort. If we instead take one of the most disadvantaged departments in mainland France, *Creuse*, the density of electricity stood at par with Algeria in 1925, yet reached double (192.8 kWh per capita) the Algerian level in 1955. Even more impressively, *Corsica* island had almost no electricity in 1925 (1.3 kWh p.c.), then lied above Algeria (130 kWh p.c.) in 1955. From this standpoint, the *Corrèze* (another relatively poor department next to *Creuse*) was indeed preferred to *Zambèze*, as urged by the famous motto of the "Cartierist" political movement in the 1950s ("*La Corrèze plutôt que [rather than] le Zambèze!*").

³⁷ Dumont (1966) harshly criticizes this biasedness of post-WW2 investments under the FIDES.

³⁸ The drop in the share of education expenditures is mainly due to the temporary increase of the share of public works for post-WW2 reconstruction.

education personnel constituted 36-37% of the total of civil servants. Yet this effort was dramatically biased towards European settlers. In Algeria, a specific credit line is reported for the European sub-sector, and we could calculate that 78% of total educational expenditures actually went to it in 1925, 82% in 1955; the same figure was also 79% in 1925 Morocco. In terms of expenditures per pupil, European children in Algeria finally enjoyed the same level as metropolitans. In contrast, in 1955 Algerian children received no more than in other parts of the Empire.

Among Autochthons, primary school gross enrollment rates (6 to 13 year-old) were extremely low in 1925: 4% in NA, 5% in Indochina, and 2% in WCA. This is counting only recognized public and private schools, not unofficial koranic schools³⁹, or municipal schools in Indochina.⁴⁰ In 1955, enrollment had increased, yet only to 18 in NA and 12% in WCA; 13% in 1943 Indochina. Tunisia, Madagascar and Cameroon displayed the highest rates, around 30%, followed by Togo (23%). In the case of Tunisia, modernization attempts in the 19th century led to the foundation of the Sadiki high school in 1875 (Sraieb 1993); then under French rule, bilingual “Franco-Arab” and “modernized” koranic schools likely encouraged indigenous enrollment. In contrast, in Algeria schools only taught in French, and the local government of settlers explicitly rationed the provision of education to Autochthons until late (Ageron 1979, pp. 152-167 & 532-536); yet enrollment accelerated in the 1950s so that at country independence in 1962, the rate was double the level of 1955, i.e. 33%. In the highlands of Madagascar (*Imerina*), a few protestant missions proposed some schooling as early as in the 1820s, and then were placed under state control by king Radama I (Campbell 2005 pp.86-89). In Togo and Cameroon, mission schools came in under German rule, yet it is only after WW2 that the secularist stance of the French Republic was relaxed enough to authorize and subsidize a larger number of mission schools (Cogneau & Moradi 2014; Dupraz 2017). At secondary level, only Tunisia, followed by Madagascar and Cameroon, lie significantly above the average, although at very low levels (respectively 3.4, 1.8 and 0.8% of 11-18 year-old indigenous children, while at the same time this gross rate reached 19.2% in metropolis). At the end of the day, even with the Tunisian exception, the educational performance of settlement colonies is far from impressive.

³⁹ Koranic schools in Algeria gathered 36,000 pupils in 1932, 100,000 pupils in 1950, see Kateb 2004.

⁴⁰ In these estimates, Jewish children in Tunisia and Morocco are counted apart: in 1925 they already enjoyed universal primary schooling, like Europeans.

Table 7 – Public expenditures and development outcomes in 1925 and 1955

	<u>Metropolis</u>	<u>Empire*</u>	<u>NA</u>	<u>Indoch.*</u>	<u>Madag.</u>	<u>WCA</u>
Year 1925						
Infrastructure & support to production						
Share in expenditures (%)	41.8	43.5	49.6	37.6	32.5	46.1
kWh per inhabitant	318.5	n.a.	6.5 ^a	n.a.	n.a.	n.a.
Roads meters per 1000 inhabitants	19.2	n.a.	1.0	0.9	n.a.	n.a.
Railroads meters per 1000 inhabitants	1.10	n.a.	0.6	0.1	n.a.	0.2 ^b
Education						
Share in expenditures (%)	20.3	7.4	9.3	6.7	6.4	3.6
Gross primary enrollment, autochthons (%)	135.3	3.5	4.1	4.7 ^c	n.a.	1.7 ^d
Government schools only (%)	108.4	n.a.	3.8	4.2	n.a.	n.a.
Health						
Share in expenditures (%)	5.9	5.8	6.6	4.3	11.5	5.8
Public health personnel per 1000 inhabitants	1.40	0.14	0.31 ^a	0.08	0.26	0.09
Medical staff per 1000 inhabitants	1.27	0.04	0.15 ^a	0.02	0.08	0.03 ^d
Administration, Finance, Justice and Security						
Share in expenditures (%)	31.9	32.0	24.8	41.6	27.8	30.7
Share in employment (%)	25.0	56.0	46.1	63.5	55.1	58.4
Year 1955						
Infrastructure & support to production						
Share in expenditures (%)	54.9	49.2	47.3	24.0	45.9 ^e	53.9 ^f
kWh per inhabitant	1,148.0	39.5	91.0	3.4 ^b	11.8	5.9
Roads meters per 1000 inhabitants	15.0	4.7	5.0	1.0 ^b	5.9	4.4
Railroads meters per 1000 inhabitants	0.9	0.2	0.3	0.1 ^b	0.2	0.1
Education						
Share in expenditures (%)	13.5	11.3	13.4	10.9	7.0 ^e	7.7 ^f
Gross primary enrollment, autochthons (%)	109.8	14.5	17.6	13.1 ^b	32.2	12.4
Government schools only (%)	92.9	10.7	17.1	11.4 ^b	20.9	6.4
Health						
Share in expenditures (%)	11.6	8.1	7.7	6.5	8.3	8.7
Public health personnel per 1000 inhabitants	n.a.	0.58	0.65 ^g	0.17 ^b	0.82	0.54
Medical staff per 1000 inhabitants	1.97	0.30	0.29	0.04 ^b	0.50	0.27
Administration, Finance, Justice and Security						
Share in expenditures (%)	15.8	21.8	24.5	42.2	16.2 ^e	17.2 ^f
Share in employment (%)	25.9	42.1	47.4	n.a.	n.a.	38.5

Notes: *: 1955: Empire average is without Indochina. Data on Indochina is 1953 (except PMS region 1954), except when noted (see h); a: Algeria and Morocco only; b: AOF only; c: Autochthonous municipal schools not taken into account; d: AOF, Togo and Cameroon only; e: 1956; f: AEF = 1954; g: Tunisia only; h: 1943.

The same conclusion holds for health. In the metropolis, the provision of health assistance and medical services mainly relied on the private sector on the one hand and on lower administrative layers (*départements* or municipalities) on the other, and it is only under the Fifth Republic (after 1958) that a national and centralized public health system took off. This explains why health does not get a much higher share of expenditures compared to colonies. In colonies the private sector was less developed, yet the same kind of bias applies to settlement colonies of NA. Then, with this indicator colonies do not look too different from each other; the most favored is Madagascar in 1925, thanks to a specific effort there towards indigenous basic health assistance (“*Aide médicale indigène*”). The total number of health professionals (physicians, pharmacists, dentists and midwives) per inhabitant is easier to compare across areas. According to these estimates, the metropolitan health supply stands far above (1.27‰). In 1925, Algeria came second (0.23‰ in 1925 while Morocco is at 0.05), followed by Madagascar (0.08). Yet in 1955, all colonies had converged towards a narrower interval ranging between 0.18 (Morocco) and 0.50‰ (Madagascar, Algeria being at 0.40). Here again, 1943 Indochina is dramatically lagging behind (0.04‰).

In 1925, “sovereignty spending” i.e. general administration, financial services, justice and security, still represented one third of expenditures and gathered the majority of public employment, even more if including military spending funded by the metropolis (see Table 2). Security in particular meant many low-pay indigenous police force (59% of sovereignty employment), especially outside of NA colonies. In 1955, this kind of spending had lost its weight in Madagascar and WCA, both in budgets and in labor force. The number of police men had little increased in per capita terms, but they turned more professional, with wages in this sector being very significantly raised, especially after 1949. In NA, such a move was not observed, and sovereignty spending kept the same share in 1955 as it had in 1925. By all means, the ratio of education and health investments to “order” spending, considered by Frankema (2011 p. 144) for pre-WW2 British Africa, had everywhere increased after 1945, signaling a more developmental orientation, and non-settler colonies had caught up with NA in this respect.⁴¹ Expenditures remained significantly biased, but bias had decreased, outside of the Indochinese wartime exception. Besides, this greater emphasis on development also came with increasing costs, as Autochthons were reclaiming equal access to high-standard public goods as well as equal pay in civil service.

High costs

The wage costs of the colonial states had always been high, firstly because of the high emoluments and bonuses paid to expatriate French civil servants (on West Africa, Huillery 2014).

Before WW2, three wage schedules were distinguished in colonial civil service: “European” or “metropolitan” / “federal” or “common” / “local”. They referred to the capacity to exert functions in all territories including metropolitan France / in a group of colonies (AOF for instance) / in a given colonial territory only. Before WW2, only French citizens could be found in the metropolitan schedule. For a given nominal position, the base wage could be 20 to 50% lower

⁴¹ Circa 1925, the structure of expenditures in French West and Central Africa is very similar to the one observed by Frankema for British Africa. See Frankema 2011, p. 142, Table 3. Our own analysis in a companion paper suggests that in West Africa, British colonies went through the same evolutions as French colonies after WW2; see Cogneau, Dupraz & Mesplé-Somps, 2017.

in the local schedule compared to the metropolitan.⁴² It is hard to evaluate what were the respective shares of racial discrimination on the one hand, of differences in training and skills on the other hand, in this wage gap; indeed positions carrying the same name (for ex., “teacher 2nd class”) implied different exams and degrees in each schedule.

On top of the gap in base wages, bonuses meant to compensate for expatriation could be very high: from 25 to 70% of gross wage, depending on the territory and/or the period, to which a variety of allowances for remoteness, riskiness, housing, family charges and cost of living were added. In Algeria and after WW1 in Tunisia, French settlers hired on the spot also received a 30% wage bonus (“*tiers colonial*”), even when they were natives and did not suffer from homesickness.⁴³ Even if they were reserved to French citizens in the first place, in skilled occupations like teachers, some of these allowances could be extended to Autochthons, this pulling all the wage schedules upward.⁴⁴ Another example of this anchoring of Autochthons’ wages to Europeans’ wages is given below in the case of Indochina.

Budget accounts for Madagascar and Indochina in the 1920s and 1940s are the rare ones in our data that allow breaking down the workforce and the wages by citizenship.

As shown in Table 5 (first and second rows), French civil servants represent in 1925 Indochina 12% of total employment in central government, but 58% of the wage bill; corresponding figures for Madagascar are close: 11 and 56% respectively.⁴⁵ Similar data for 1943-1946 (Table 5, bottom panel) show that the Autochthons’ share in public employment little moved over two decades, as if the French share was incompressible in high positions.⁴⁶

Yet their average compensation is strikingly 2.52 times (+152%) higher in 1925 Indochina compared to 1945, and also compared to Madagascar at both dates.

At the top of the hierarchy, the general governor is paid 1937 PPP FF 406,000 in 1925 Indochina vs. 280,000 in Madagascar, hence a 45% difference only. The base nominal wage in current francs is in fact different by 25%: 50,000 vs. 40,000. They receive the same large bonuses, about 2.8 times the base wage (at the 1925 exchange rate of the piaster), comprising not only the so-called “colonial supplement” but also travel and entertainment expenses. The rest of the difference then stems from price levels which are 18% lower in Indochina, according to our estimates. However, in 1925 Indochina the same level of bonuses applies to all French civil servants, more than tripling the base wage in francs. In Madagascar, like in other SSA colonies, bonuses and allowances only reach 70% of base wages.

⁴² One example is provided for teachers in Togo by Gbikpi-Benissan, 2011, vol. 2, p. 203.

⁴³ Interestingly, this kind of bonuses were also applied to overseas territories that remained French after 1960, and are still applied today whatever the place of origin of the civil servant.

⁴⁴ For instance West African teachers exerting outside of their colony of origin, i.e. in the intermediate “federal” schedule, benefitted from a remoteness allowance (“*indemnité de dépaysement*”) equal to 4/10 of base wage. Further, from 1925 to 1935 all indigenous teachers in Togo were granted a special bonus (“*indemnité spéciale du Togo*”), first equal to 6/10, 7/10 in 1927, and then gradually diminished to 3/10 in 1933 before to be cancelled due to financial restrictions. Gbikpi-Benissan, 2011, vol. 2, p. 205.

⁴⁵ In Madagascar, data on employment and wages by citizenship and administrative sector are for 1921 and 1929, yet total wage bill by sector is observed for 1925. We estimate employment by sector in 1925 as the average of the two former years, and deduct wage differences. In Madagascar, the average wage computed from definitive accounts is slightly higher than the one computed from provisional budgets, by 12%; in Indochina it is slightly lower, by 5%. This makes that figures from Table 5 and Table 6 are not perfectly consistent.

⁴⁶ Data for 1912-13 Indochina suggest that the share of French was just a bit higher, at 13%. Whereas it had expanded quite quickly from 1913 to 1925, public employment little progressed between 1925 and 1937, and little again in wartime. It even seems to have been reduced by 25% in Indochina occupied by Japan, and this reduction could have affected more the Indochinese personnel than the French.

Table 5 – French and Autochthons in civil service 1925 & 1945, Indochina and Madagascar

	Indochina		Madagascar	
	French	Autochthons	French	Autochthons
Year 1925				
Share in total employment (%)	12	88	11	89
Share in wage bill (%)	58	42	56	44
Average annual public wage (1937 FF)	71,315	7,086	28,344	2,752
in units of GDP per 15+ pop.	66.6	6.6	28.1	2.7
in units of GDP per 15+ of each group ^a	1.1	7.3	1.0	3.6
Years 1943-1946				
Share in total employment (%)	10	90	12	88
Share in wage bill (%)	41	59	49	51
Average annual public wage (1937 FF)	29,541	4,392	24,893	3,452
in units of GDP per 15+ pop.	47.7	6.8	20.5	2.6
in units of GDP per 15+ of each group ^a	0.9	8.4	1.1	3.5

Notes: In Madagascar, data on employment and wages by citizenship and administrative sector are for 1921 and 1929, yet total wage bill by sector is observed for 1925. We estimate employment by sector in 1925 as the average of the two former years, and deduct wage differences. 15 year-old population was estimated at 59% (resp. 61%) of total population for 1925 (resp. 1945) Indochina, 69% (resp. 59%) for Madagascar; 71% (resp. 64%) for the French in both cases. In the bottom panel (1943-1946), data for Indochina do not comprise the general government, only local budgets of Cochinchina (1944), Annam (1945), Tonkin (1945), Cambodge (1945) and Laos (1943). In 1925, wages are higher by 80% for Autochthons at the federal level, yet employment is only 9% of total, so that the correction of this bias is innocuous. Data on Madagascar is for 1946.

a: using estimates of average income of French and Autochthons, see Appendix Table A.1.

The story of these very high Indochinese wages is the following. At the beginning of WW1, the convertibility of the French franc into gold had been suspended. Due to the war, France accumulated large budget deficits, financed by monetary expansion, and trade deficits, resulting in high inflation and large depreciation of the franc against the dollar, the sterling and also the Indochinese currency, the piaster. Indochina rather displayed trade surpluses, the piaster was silver based, and inflation remained low throughout the war and in the 1920s. From 2.5 francs for one piaster in 1913, the exchange rate went down to 17 in 1926, then stabilized around 12 under the Poincaré government, before to be pegged at 10 after 1930 (Brocheux & Hémerly, pp. 134-135. Giacometti, 1998).

From 1913 to 1917 in metropolitan France, nominal wages of civil servants had not been changed, hence had lost purchasing power a lot. Then, from 1918 to the end-1930s, nominal wages gradually recovered, starting with the lowest wages of postmen or teachers. By 1925, the top wages of university professors or administration executives were still lower by 40% than their 1913 level (Piketty 2018 pp. 182-191 & pp. 833-834). For expatriates, metropolitan schedules directly applied to all colonies.

As the franc was depreciating quickly, translating wages set in francs into piaster would have led to huge losses in purchasing power. The government of Indochina then decided to set a specific schedule making correspond to every base wage in franc a colonial supplement in piaster (Dareste et al. N°4, Oct.-Dec. pp. 1080-1083). The schedule was progressive, in that wages at the

bottom of the scale received proportionally higher supplements, in line with the metropolitan policy of gradual wages recovery. It was revised each year all along the 1920s. Therefore the Indochinese supplement fixed in piaster ended up representing the bulk of the pay: in 1925, it ranged between 2 to 4 times the base wages, when going down the scale from the top (governor) to the bottom. In contrast with the metropolis, not only the real wages of French civil servants were preserved in Indochina, but they even increased quite sharply between 1913 and 1925, from 1937 PPP FF 52,649 to 71,315 (i.e. by 36%).⁴⁷

According to a September 1920 decree, the “colonial supplement” had to be six tenth of the base wage in francs in Madagascar, and seven tenth in Indochina (Dareste et al. N°1, Jan.-Mar. pp. 89-98). Our data indicate that in Madagascar the applied supplement was actually seven tenth.⁴⁸ In Indochina, the specific supplement schedule did not fit the seven tenth rule and was more advantageous, especially for low wages. For example, a French civil servant paid at the Madagascar 1925 average wage of around 9,325 francs, corresponding to a middle rank executive or to a second class teacher, received a 6,527 francs supplement in Madagascar, but rather 3,990 piasters in Indochina, worth 31,290 francs at the 1925 exchange rate; when transported to Indochina, his wage rate was then 41,245 francs rather than 15,852, or in 1937 PPP francs 87,300 rather than 25,588. The figure in Indochina is higher than in Table 5 because the supplement in piaster had tapering rates. We conclude that the bulk of the gap in French average earnings can be attributed to the setting of this “colonial supplement” in 1920-1930s Indochina. While the two colonies were rather close in average income, this gap meant that in Indochina the average French civil servant earned 66.6 times the GDP per worker, against 28.1 in Madagascar (Table 5, fourth row).

Why is it that the colonial supplement was so generous in 1925 Indochina? Strikingly enough, our tentative estimates of the average income of Europeans (Table A.1 in Appendix) stand at par with average wages in the civil service in both colonies (Table 5, fifth row).⁴⁹ Then, everything is as if the large bonuses paid to civil servants in Indochina were meant to offset a high reservation wage, as Europeans in the private sector were much richer, as well as in lower numbers, than in Madagascar, where many relatively poor French men from neighboring *Réunion* island had immigrated. Hence, the rationale for the Indochinese exception must have been the wish to attract skilled civil servants in the most profitable and strategic, yet remote, colony.

It is only at the end of 1930s that the difference between the arbitrary piaster supplement and the seven tenth turned small, at all base wages; nominal wages in francs had recovered, so that the special supplement schedule had gradually lost its motivation. Further the bankruptcies of the Great Depression had also diminished private benefits, hence the civil servants’ reservation wage (Brocheux et Hémerly 1994, pp. 260-269). WW2 finished pulling down the wages in Indochina, back to the same levels as in Madagascar. According to Bassino’s estimates, the once buoyant Indochinese economy collapsed under the Japanese occupation, GDP per capita being halved between 1940 and 1945, and would never entirely recover. Between 1937 and 1945, inflation was extremely high in both colonies: in Indochina prices were multiplied by 5.8, even 6.7

⁴⁷ The general governor and the governors of four territories (not Cochinchina) make one exception, but it is that their base nominal wages in francs were lowered between 1913 and 1925.

⁴⁸ The colonial supplement was supposed to be seven tenth in AOF and nine tenth in AEF. Our data rather suggest it was seven tenth in all Sub-Saharan Africa colonies until the end of WW2. Before WW1, it seems to have doubled the base wage in SSA and Indochina.

⁴⁹ Recall that, at least for Indochina, these are rather precisely measured thanks to income tax data collected by Alvaredo, Cogneau & Piketty (2017).

in Madagascar; yet nominal wages were less adjusted in the former. French public wages kept up with Europeans' average earnings in each place, as the latter collapsed by almost 60% in Indochina whereas we estimate that they only fell by 25% in Madagascar, mostly because the number of French colonists doubled in the 1930s, new immigrants being less affluent than first comers.

The setting of French wages also influenced that of Autochthons. In 1925, the average French civil servant was paid 10 times what the average Autochthon received in both colonies (Table 5, third row). This also means that the latter was paid 2.6 times (+158%) more in Indochina. It is quite surprising, as indigenous civil servants were not paid the colonial supplement. Some "parallelism" was actually sought between the metropolitan and the local wage schedule, in order to be able to attract apt Autochthons who could substitute to Europeans. During the period of the depreciation of the franc (1918-1930), a generous and progressive exchange rate was then applied to translate the wages from francs into piasters. In 1926 for instance, when the actual exchange rate was near to 10 francs per piaster, an exchange rate 3 to 3.5 (depending on base wage level) was applied, meaning a bonus of $10/3-1=2.33$ in terms of the base wage in francs.⁵⁰ The wages of subaltern personnel, which had no correspondence in francs, were presumably also pulled upward. In all, the real wages of autochthonous civil servants also went upward between 1913 and 1925, from 1937 PPP FF 4,219 to 7,086, that is by 68%.⁵¹

Here again most of the gap in earnings with Madagascar can be accounted by policy. This "parallelism" between Europeans' and Autochthons' wage schedules then explains why our measure of wage dualism is so high in 1925 Indochina compared to Madagascar. In Indochina, the average Autochthon in civil service earned 6.7 times the GDP per worker, while the same ratio only reached 2.7 in Madagascar (Table 5, fourth row). According to Jean-Pascal Bassino's estimates for Indochina's GDP and to our own extrapolation of Madagascar's GDP, the average Autochthon was equally poor in the two countries. Then, as the "parallelism" motive pulls wages upward, dualism is twice larger in Indochina among the Autochthons, with average wage in civil service reaching 7.3 times the average Autochthons' income against 3.6 in Madagascar.⁵²

In 1943-46, the Autochthons' average also improved significantly in Madagascar, so that it was only seven times lower than the French one, against ten times before. In Indochina, the Autochthons' once generous schedule was shifted down drastically, in parallel with the French's, yet their average wage displays the same ratio to the French level as in Madagascar (7, against 10 again in 1925). If only due to skills' upgrading, some catching-up process was under way.⁵³ Yet in both colonies dualism indicators little moved. As for Autochthons, the ratios of public wages to GDP per worker are the same as in 1925; again, in Indochina the collapse of average earnings in the private sector is almost perfectly parallel to the fall of public wages.

⁵⁰ See for instance, where the term 'parallelism' is used: Gouvernement Général de l'Indochine, 1931. *Recueil général de la législation et de la réglementation de l'Indochine, Supplément de 1926-1927, Deuxième partie (Arrêtés, décisions et circulaires du gouverneur général et des chefs d'administration locale) et Troisième partie (Ordonnances des souverains de l'Annam, du Cambodge et de Luang-Prabang)*, pp. 154-156. [National Library of Vietnam].

⁵¹ Employment increases more in administrative sectors paying initially higher wages, like education and health, yet the composition effect is limited. The Paasche index of wages increases by 54% and the Fisher by 63%.

⁵² The data we collected also allow us to look at the lowest paid teachers; in 1925 Indochina, the lowest teacher wage was 3.8 times the average Autochthons' earnings, whereas in 1925 Madagascar, the same ratio only reached 2.1. This difference could be overstated if we underestimate GDP in Indochina, at least in Annam and Tonkin. If only in Cochinchina, the reservation wage would be binding as much as in Madagascar, as the GDP per worker is there estimated to be 2.3 times the Indochinese average.

⁵³ In 1913 Indochina, this wage ratio was 12.7.

As already said above, Autochthons represented around 90% of public employment in 1925/1945 Indochina and Madagascar. Scarcer evidence suggests that the same proportion applied to West and Central Africa.⁵⁴ In North Africa, the share of Muslim Autochthons was much lower, given the labor supply from French settlers. They made not more than 40% of civil servants, concentrated in low-skill and low-rank positions.⁵⁵ We estimate their share at 37% in 1925 NA. Among French civil servant in NA, the share of natives must have varied greatly depending on the territory and the date considered; we estimate that only 5% of French civil servants had been hired in the metropolis in 1925 Algeria, against 36% in Tunisia and 63% in Morocco (where the protectorate was recent and settlers were still few).

The combination of wage bonuses with the composition of employment in terms of citizenship and origin (expatriate / settler / autochthon) translates into differential relative costs of public employment. Let's assume that in 1925 expatriate French civil servants all received a 7/10 wage supplement, except in 1925 Indochina where they received 30/10 (see above), and that French settlers in North Africa all received a 3/10 supplement. Let's also assume that bonuses do not stimulate labor productivity (no efficiency wage mechanism). Then, in comparison to the metropolis, the impact of bonuses on wage costs would have been +8-9% in Madagascar and WCA, +22% in Indochina, and +32% in NA (from 22 in Algeria to 44% in Morocco).⁵⁶ These calculations disregard any "pull effect" on Autochthons' wages. The "parallelism" mentioned above for 1925 Indochina actually raised the wage costs in this colony by +82%.

Due to high wage costs and also to the transport costs of materials imported from the metropolis, monetary expenditures overstate the volume of public service and output. Especially in NA and Indochina, the reality of service provision by civil servants lies between wage expenditures per capita and employment per capita, yet closer to the former than to the latter.

After 1950, the official distinction between citizens and subjects was abolished. The pre-war three schedules mentioned above were renamed "general" / "superior" / "local", in order to withdraw references to race, citizenship status, origin or place of recruitment that were explicitly forbidden by law.⁵⁷ Wage bonuses were at the same time significantly decreased. After 1950, executives in the upper-tier, most often from the metropolis, only received a 40% bonus in WCA

⁵⁴ In 1926 Togo, African primary school teachers and lower rank instructors made 88% of education personnel (68% if we restrict to teachers): Gbikpi-Benissan, 2011, pp. 217-218. In 1938 Cameroon, 595 French men are enumerated in public service, according to a census (Ministère de la France d'Outre-Mer, 1947. *Annuaire Statistique du Cameroun 1938-1945*, volume I. Paris : Imprimerie Nationale, Tableau VIII p. 33). In our data, total public employment is 5,097, so that Autochthons again make 88%.

⁵⁵ In 1921 Tunisia, more than 5,000 European civil servants were enumerated in the population census, while in our data for 1925 total public employment is around 10,000 (Régence de Tunis, *Statistique générale de la Tunisie 1925*, pp.8-9). In 1925 Tunisia, 35% of teachers are from the metropolis, 44% are French recruited on the spot, and only 21% are Autochthons (Min. des Aff. Etrangères. *Rapport au président de la République sur la situation de la Tunisie en 1925*, p. 47). In 1936 Algeria, according to population census Europeans make 62% of workers in public services and army (Gouv. Gal de l'Algérie, *Annuaire Statistique de l'Algérie 1939-1947*, p.26).

⁵⁶ These calculations take into account the status composition of employment in each sector (general administration, security, justice, financial services, health, education, infrastructure, support to production), assuming in particular that the Madagascar composition applies to all WCA. In particular, police forces have everywhere a lower number of French, except at very high ranks (officers). For NA, status composition in education sector is known for 1925 Tunisia; we then assume that in other sectors the French civil servants are over/under represented (compared to education sector) like in 1925 Indochina.

⁵⁷ See for instance: République Française, « Loi n° 50-772 du 30 juin 1950 fixant les conditions d'attribution des soldes et indemnités des fonctionnaires civils et militaires relevant du ministère de la France d'outre-mer, les conditions de recrutement, de mise en congé ou à la retraite de ces mêmes fonctionnaires ». Of course in practice, even if not in law, these categories still correlated with race or origin.

and Madagascar, instead of 70% before.⁵⁸ For 1955, the decrease of wage bonuses should have mitigated their wage cost effect to 5% in SSA and 22% in NA. This adjustment was made easier because most of the top administration had been faithful to Vichy and was wiped out and replaced after 1944.⁵⁹ Public employment Africanized a bit in the late 1950s, but not much, even in NA where the room for progress was the largest. Africanization contributed to reduce the costs somewhat, but remained limited.⁶⁰

Table 6 – Public Employment and Wages in 1925 and 1955

	<u>Metropolis</u>	<u>Empire</u>	<u>NA</u>	<u>Indoch.</u>	<u>Madag.</u>	<u>WCA</u>
Year 1925						
Civilian expend. per capita (1937 FF)	524	63	133	68	57	25
Public employment per 1.000 inhab.	11.8 ^a	2.2	2.9 ^b	1.7 ^c	3.9	1.4 ^d
Annual average public wage (1937 FF)	17,049 ^a	11,702	12,902 ^b	15,858 ^c	5,327	6,504 ^d
in units of GDP per 15+ pop.	1.7 ^a	9.3	4.8 ^b	14.8 ^c	5.3	8.1 ^d
Year 1955						
Civilian expend. per capita (1937 FF)	3,070	277	479	n.a.	209	153
Public employment per 1.000 inhab.	21.6	4.6	6.8	n.a.	4.8 ^e	3.1
Annual average public wage (1937 FF)	30,389	20,087	22,791	n.a.	12,343	17,938
in units of GDP per 15+ pop.	1.9	8.0	5.5	n.a.	6.3	11.2

Notes: a: 1922 for employment, 1923 for wage bill; b: Tunisia = 1924; c: Cochinchina 1924; d: Soudan, Côte d'Ivoire and Togo = 1926. e: extrapolated under the assumption that provincial employment is paid the same average wage as central government employment. 15 year-old population was estimated using population censuses.

Like during WW1 although less sharply, in the metropolis civil servants wages had lost purchasing power during WW2 and the wage scale had been compressed, in particular through a lump-sum increase granted by the freed France first government in 1944. From 1948 to 1955, Metropolitan nominal wages recovered, more quickly than after WW1, and the wage scale widened again (Piketty 2018 pp. 191-194). Wartime inflation had been higher in NA colonies compared to the metropolis. As of 1955 compared to 1937, the differential with the metropolis was erased in Algeria, but preserved in Tunisia and Morocco, so that real wages remained more depressed in the two latter colonies, by 19 to 26% according to our (coarse) estimates.

In contrast, in WCA, 1937 to 1945 inflation had been much lower compared to metropolis. Madagascar made an exception in SSA, as 1937-45 inflation was the same as in metropolitan France. The AOF and AEF inflation patterns led to the creation of the CFA franc in December

⁵⁸ See for instance : République Française, « Décret n° 51-511 du 5 mai 1951 fixant, en application de la loi n° 50-772 du 30 juin 1950, les régimes de rémunération, des prestations familiales, des congés administratifs de certains cadres de fonctionnaires civils relevant du ministère de la France d'outre-mer. »

⁵⁹ On the Vichy period: Jennings 2001, and Cantier & Jennings 2004 (especially pp. 334-363 on the aftermath of Vichy). On the replacement of colonial governors, see Chambru & Viallet-Thévenin 2017.

⁶⁰ For 1955, Amin (1966) reports 64,000 non-Muslim civil servants out of 95,000 in Algeria (p.153), 18,000 over 30,000 in Tunisia (p. 161), and 41,000 over 68,000 in Morocco (p. 174), i.e. respectively 67, 60 and 60%, and 63% on average when our estimate for 1925 was 63%... (see above). In 1945 Morocco, 71% of primary school teachers are French, 59% in 1955 on the eve of independence (Roy. du Maroc, *Tableaux économiques du Maroc 1915-1959*, p. 37). In the school year 1962-63, just after Algeria's independence and the departure of many French settlers, "foreigners" still make 41% of all teachers from primary to senior secondary level (Office National des Statistiques de l'Algérie, *Rétrospective 1962-2011*, p.121, Table 4. <http://www.ons.dz/-Retrospective-1962-2011-.html>).

1945; SSA colonies (then including Madagascar) got a new currency, with an appreciated fixed exchange rate of 1.7 (1946-47), then 2 in 1948.⁶¹ The new exchange rate fitted with parity in price levels in 1948, with the exception of Madagascar; this was still true in 1955 AOF or Togo, less true in AEF in Cameroon who experienced more inflation in the years 1949 to 1955 and it was very much overvalued in Madagascar. As in WCA nominal wages formerly paid in francs were paid in CFA francs at the same level and were subject to the same proportional increases in nominal terms, 1937-1955 inflation differentials alone generated large gains in real wages, by around 57% in AOF and Togo, 25% in AEF and Cameroon, and not much in Madagascar. Further, the purchasing power of these wages in the metropolis, or in French imports, was preserved through the CFA franc appreciation.

At the end of the day, despite lowered bonuses, everywhere metropolitan level wages were still paid to the French civil servants, while Autochthons claimed and partially obtained equal treatment, so that wage dualism remained high.

Table 6 shows per capita figures for civilian expenditures and public employment, as well as average public wages for the years 1925 and 1955. We observe that due to wage costs, the gaps in public employment are narrower than the gaps in expenditures. In 1925 or 1955, the colonies where expenditures per capita are the highest (NA and Indochina), are also the ones where average wages are the highest. Wage dualism, again measured by the ratio of the average wage to GDP per working age population (15 year-old and over) is highest in the poorest colonies of SSA.

As expenditures per capita skyrocket after the war (Figure 3), the number of civil servants per inhabitant increases much less, because the average wage doubles and even triples in WCA. Wage dualism again increases slightly. In 1955, the average civil servant earns more than five times the GDP per worker in NA, six times in Madagascar, up to eleven times in WCA; this ratio hardly reaches two in the metropolis, as it already did in 1925.

In NA, between 1925 and 1955, the average wage more or less followed the increase in GDP per worker. In WCA, it widely overtook this increase. The main reason is the lower inflation and the CFA franc, as wages paid in the new currency follow the French schedules and apply the same nominal increases. Another factor is the structural change of indigenous employment from low-pay tasks like security to high-pay tasks like education and health; besides, police forces get professionalized and receive much higher wages than before. Such a structural change is not observed in NA colonies. Wages of the lowest and best paid teacher and of the lowest and best paid nurse were collected, for 1913, 1937, 1949 and 1955. Although particularly noisy, they do not reveal a very salient trend in the wage scales, and if anything a compression in WCA as more skilled autochthonous teachers and nurses are being recruited.⁶² This kind of compression was already observed in 1945 Indochina and Madagascar (compared to 1925), between French wages and Autochthons' wages. Yet it did not mean a significant change in dualism.

⁶¹ NA colonies stayed with the franc until their independence, like Indochina with the piaster. Guinea left the franc zone in 1960, Mali only for a while between 1962 and 1984, and Madagascar in 1973. The exchange rate of CFAF remained constant until the CFAF devaluation of 50% in 1994.

⁶² In order to check robustness to noise, regional minima and maxima can be computed in different ways: either take the lowest and highest wage in each region, or else average the lowest and highest wages in each region. When judged from the comparison with the highest wage paid, the one of the governor, there is indeed an overall compression as governors' wages rather decrease in real terms while average wages are at least double in all groups of colonies.

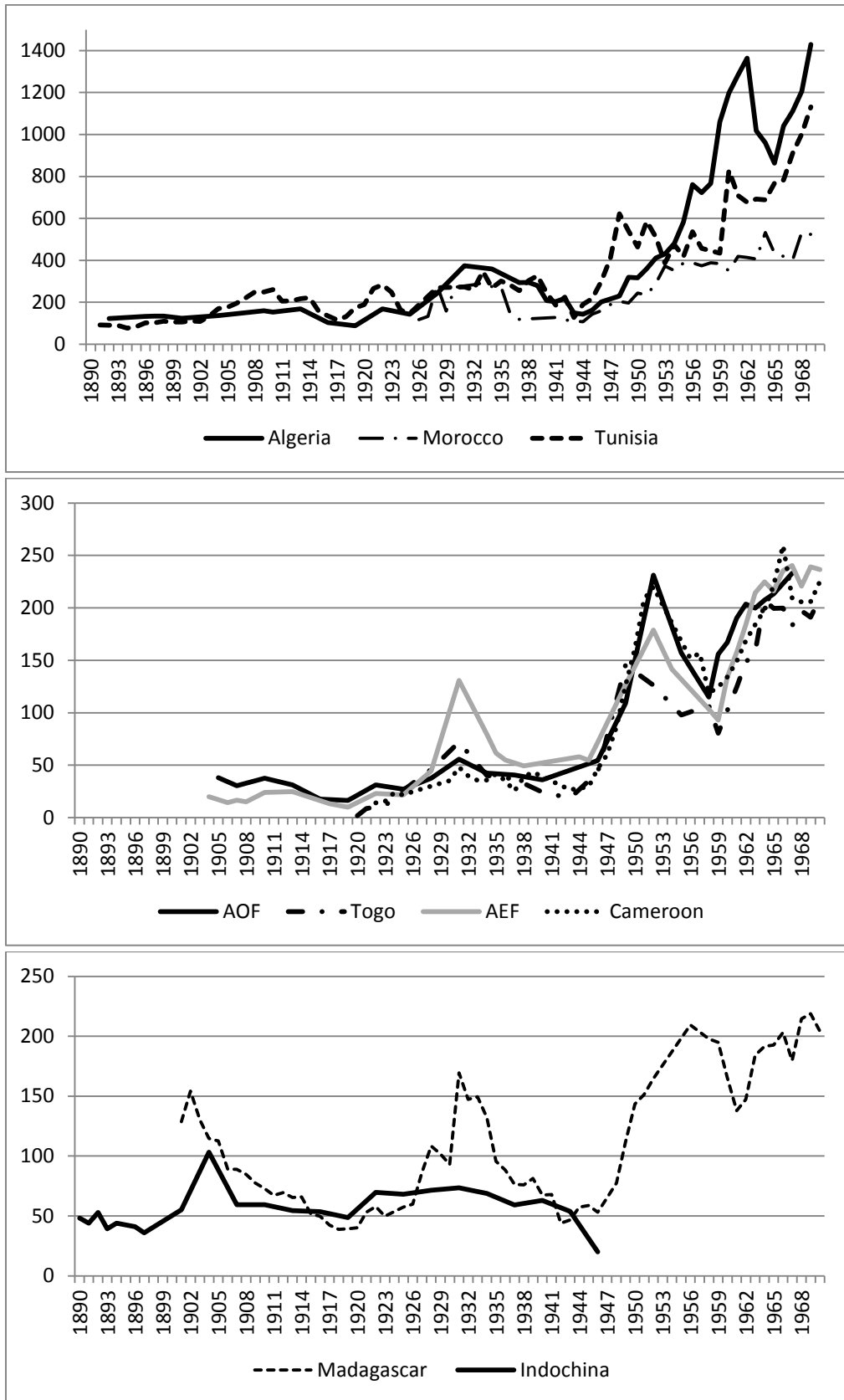
In sum, colonial public spending was very much biased in the first place and involved large costs, in particular a high wage bill, so that despite impressive increases in fiscal capacity the colonies remained under-administered. After WW2, at the same time as expenditures became less biased and more developmental, costs also increased. More skilled autochthonous civil servants were to be trained and hired, and equality in pay had to progress, under strong pressure of African trade unions (Cooper, 1996, pp. 277-322 and pp. 407-431).

In first approximation, the pre-WW2 colonial political economy could fit in the two-group model of Besley and Persson (2009), in the case they consider of an “autocracy ruled by the rich”, here the colonizers. The ruling colonizer group displays strong biased preference towards the welfare of its members (p.1224). It taxes the colonized to redistribute income to the colonists and under-provides public goods (pp.1227-1228). Yet, as long as the colonizer expects to remain in power for a time (i.e. “political stability is high”), it invests in fiscal and legal capacity – that are complements, and even “over-invests” (p. 1231) compared to an utilitarian (unbiased) government, as the private gains from regressive redistribution outweighs the losses due to lower public goods provision. This will be even more the case in wealthier colonies. Settlers’ colonies are (i) wealthier, (ii) there the colonizer group is larger in size and (iii) not richer (compared to Autochthons) than in the non-settler case; Besley and Persson model then expects them to invest more in fiscal capacity and legal capacity on the whole, which is what we found. In non-settler colonies, who are (i) poorer, (ii) where the colonizer group represents a tinier share of the population, and (iii) where wealth inequality between colonizers and colonized is higher, it predicts less public good provision and less fiscal capacity construction, and a focus on police and security in the first place. This is also what we found for the pre-WW2 period.

However, as the time horizon of colonial rule gets shorter (independence is expected), which is represented in the model by “political instability” and the risk of being ousted from power, investments in state capacity are also predicted to decrease. And in cross-section, the more colonizers will feel threatened to lose power the less they will invest. Here the model predictions fail because the causality ran the other way around. After WW2, French colonial governments accelerated their modernization project and turned more developmental in the hope of preserving their dominance. They extended the franchise not only in the political dimension, as described in section 1, but also along the fiscal dimension, by turning fiscal extraction more progressive (section 3), by decreasing the bias in public spending and by granting some wage equality claims (section 4).

To finance this developmental phase, transfers from the metropolis increased, inaugurating some form of aid dependency for WCA colonies, as we show in the following section.

Figure 3 – Expenditures per capita from 1890 to 1970



Notes: Expenditure per capita in PPP 1937 francs with provincial and departmental expenditure included, but not municipal.

Authors like Amin (1966) on NA and Dumont (1962) on SSA have very early pinpointed the high level of public wages in newly independent states. Both criticized in particular the replacement one-to-one of French civil servants at the same wage. In NA, according to figures reported by Amin, public employment went in Algeria from 175,000 (of which 100,000 in army) in 1955 to 300,000 in 1963 (of which 120,000 in army), in Tunisia from 67,000 (37,000) to 80,000 in 1960, in Morocco from around 122,000 (54,000) to 255,000 in 1964.⁶³ Of course these large increases over 5 to 9 years hide even higher growth among Muslim Autochthons, as they represented not more than 50% of total employment in 1955 and most likely more than 80% on average in the mid-1960s, except in some occupations like secondary teachers. According to our estimates using the wage bills reported by Amin, the ratio of public wages to (non-oil) GDP per worker went down to around from 5 to 3, as the new hired were still less skilled on average and the colonial supplement was most likely cancelled; using Algerian data, the same ratio (3) is still found for 1977 Algeria. On top of large wage costs, Amin raised fears about plethoric unproductive recruitments. Similar figures are more difficult to establish for post-independence SSA. Present-day estimates suggest that the wage ratio could lie above 4 in SSA, even after the CFA franc devaluation of 1994 (Bossuroy & Cogneau 2013). Like Amin, beyond wage costs in themselves Dumont denounced the discrepancy between wage paid and actual technical skills of the new recruits, something that we cannot measure with our data.

Then we do not argue that paying well civil servants was necessarily a bad thing, as we cannot analyze the correlation of wages with productivity.⁶⁴ Yet, we argue that the colonial legacy of dualism very much determined the features of socioeconomic and political inequalities in the young independent countries. In the first two decades of their existence, an administrative bourgeoisie emerged whose economic affluence and political influence combined led to the entrenchment of patron-client relationships with the rest of society. Just after independence, the legitimacy of this new social class was high, yet as dualist features persisted and development was not shared, its initial political capital depreciated and its authority was undermined.

Aid dependency

Figure 4 shows the transfers from the metropolitan budget to the colonial budgets, expressed in proportion of colonial civilian expenditure. Military expenditures paid by the metropolis are not counted as transfers, except the ones devoted to infrastructure (roads, bridges, hospitals) and health.

For some colonies, these grants could represent a significant share of expenditures in the beginnings, usually before WW1, at a time when the fiscal apparatus was still under construction. Of course, as expenditures were also at low levels, the cost to the metropolis was not high. We calculate that between 1870 and 1919, the cumulated net metropolitan grants represented 6.5% of cumulated expenditures in the Empire, yet only 0.05% of metropolitan France GDP.

Then between 1920 and 1944, the Empire is self-financed: the same figures fall respectively to 1.2% and 0.03%. The visible exception is Central Africa (AEF) whose expenditures are financed by grants up to 6.6%; yet the cost to the metropolis is negligible, and ten times compensated by the financing of the metropolitan budget by Indochina. Transfers to AEF peak

⁶³ These figures include lower-layers of government (departments or regions and municipalities). For military forces in 1955 NA, see Mahieu, 2001.

⁶⁴ On the case of East Africa, Simson (2017) shows that public jobs were allocated meritocratically.

when Albert Sarraut was minister of the Colonies, the one who first expressed the necessity of “adding value” (“*mise en valeur*” were his terms) to the poorest colonies, which was taken by some as the first “developmental” attempt (Cornevin 1972 pp. 281-290). A follower of Sarraut at the ministry of Colonies, André Maginot, then launches in 1929 the idea of big state-guaranteed loans that are finally voted in 1931 after he is out of office, and as the Great Depression begins to reach France and the Empire. All WCA countries, as well as Madagascar, contracted these loans. The 1931 loan was especially massive in AEF, where it was used for the completion of the “*Congo-Océan*” railway line linking Brazzaville on the Congo River to Pointe-Noire on the Atlantic coast; before the mechanization of the building process, it had cost many lives of forced African laborers between 1921 and 1930. At the same time, the “*Fianarantsoa-Côte Est*” railway line is built in Madagascar, linking the highlands to the Indian Ocean. The 1931 loans were still being reimbursed in the 1950s. However, thanks to the large inflation of the 1940s that multiplied prices by 14, resulting real interest rates were negative so that interwar loans actually represented a less visible subsidy from metropolitan bondholders.⁶⁵

As can be seen again on the graphs of Figure 4, it is only after 1946, and the implementation of the Economic and Social Development Investment Fund (FIDES), that metropolitan grants take off for Sub-Saharan African colonies. In 1959, the FIDES is replaced by the Aid and Cooperation Fund (FAC). Although the colonial budgets also contribute to the FIDES, the contribution of the metropolis is major (about 70% of total).

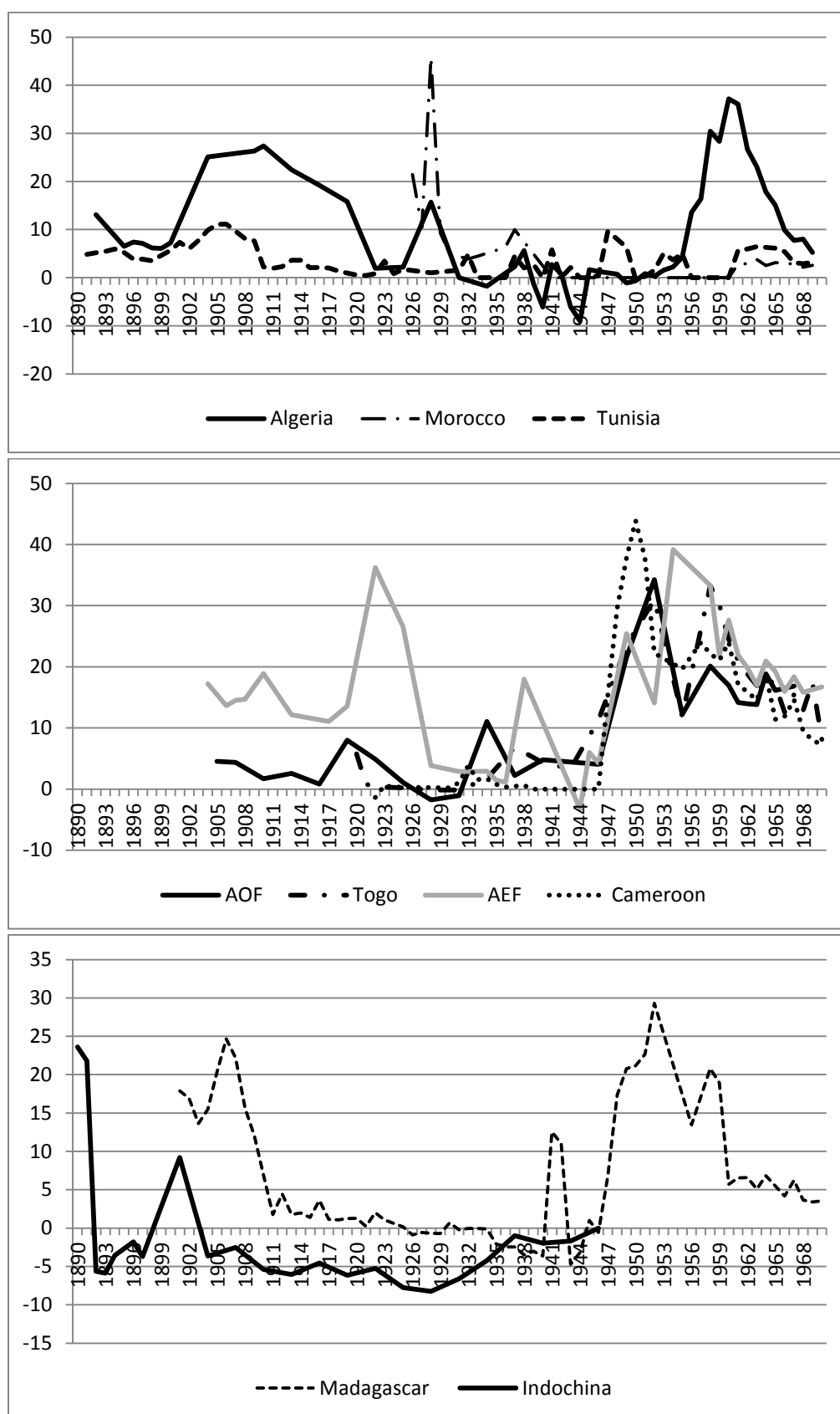
As for North Africa, Tunisia and Morocco are still mostly financed through loans under the Modernization and Equipment Fund (FME), renamed Economic and Social Development Fund (FDES) after 1955 (Saul 2016 p. 47). Algeria also borrows from the same Funds, yet, starting in 1956, also receives huge amounts of metropolitan aid, culminating in 1959-1962, under the “Constantine Plan”, aimed at industrializing the country while the liberation war is raging.

Between 1945 and 1962, metropolitan grants then finance 17.1% of the Empire public expenditures: 23% in WCA colonies, 17% in Madagascar, 20% in Algeria, very little in Tunisia and Morocco. In total, these grants represent 0.40% of cumulated metropolitan GDP during the period, one half exactly going to Algeria.

After 1963 the amounts of French aid directed to Algeria decrease quickly, to represent only 5% of the country’s expenditure in 1969, not too far from what Tunisia and Morocco also receive (3%). Madagascar also experiences a large downfall of French aid after 1960. In WCA, aid also drops after 1960, yet the share of French aid in expenditures stabilizes between 8 and 16%.

⁶⁵ To give just one example, AOF was in the 1950s still reimbursing annuities on loans contracted between 1903 and 1932, for a total debt amount of 3,526 million francs, in which the 1931 loan owned the lion share (3,120 million, disbursed in seven sections from 1931 to 1937). The total annuities reached 30 million of CFA francs, representing only 0.1% of the expenditures of the Federal budget.

Figure 4 – Metropolitan transfers in total expenditure 1890-1970 (net grants)



Notes: Negative numbers mean transfers from the colony to the metropolis (for instance Indochina 1905-1937). Military expenditures from the metropolis are not counted.

Table 7 summarizes the financing of colonial budgets over the whole colonial period from 1833 (first data point on colonial Algeria) to 1962 (last data point for colonial Algeria). It shows that only 10% of civilian expenditures were financed by metropolitan transfers overall. The cumulated cost was worth 0.15% of metropolitan cumulated GDP, more than half (0.9%) having gone to North Africa and mostly to Algeria. Net loans financed another 4% of expenditures, either through reimbursed loans on which negative real interest rates were paid (see above) or through loans that were still pending at the end of the colonial period, especially in Tunisia and Morocco. Indochina stands as an exception, as it accumulated budget surpluses and rather financed the metropolitan budgets; a large part of the use of this surplus is left unknown in our data, the “residual” being as high as the total deficit.

Table 7 – Financing of the colonial Empire by the metropolis 1833-1962

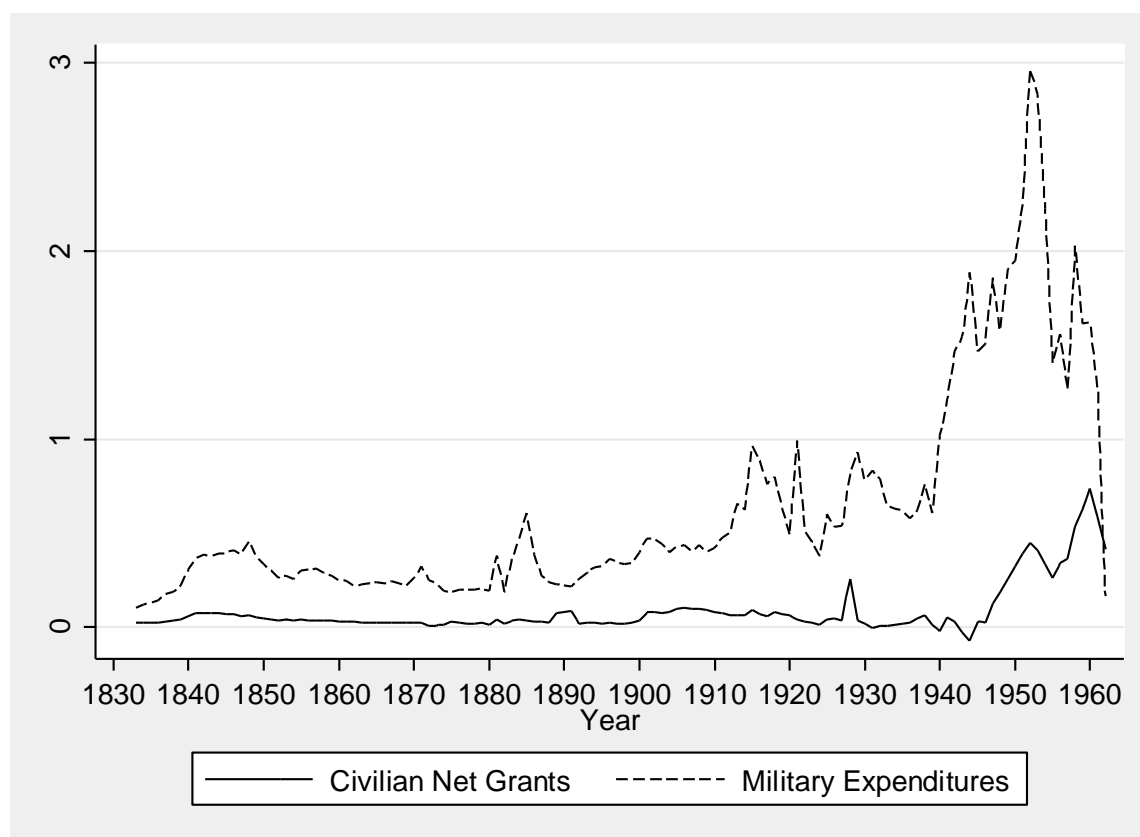
	Empire	NA	Indoch.	Madag.	WCA
In % of cumulated expenditures					
Cumulated deficit	15.1	21.6	-9.3	10.9	19.9
Cumulated net grants	10.2	11.9	-2.5	10.5	17.0
Cumulated net loans	4.3	5.2	4.4	2.6	2.3
Residual	0.6	4.6	-11.2	-2.2	0.6
In % of cumulated metropolitan GDP					
Cumulated deficit	.224	.168	-.014	.010	.061
Cumulated net grants	.147	.090	-.004	.009	.052
Cumulated net loans	.057	.043	.007	.002	.005
Residual	.020	.035	-.017	-.001	.004

Note: Net deficits, net grants and net loans are cumulated between 1833 and the year of independence of Algeria (1962). Cumulated deficit is the sum of the primary deficit (revenue-expenditure) of central and provincial administrations, expressed in real terms (1937 francs), over the period 1833-1962; a surplus has a negative sign (Indochina). Cumulated net grants are the sum of net transfers from the metropolis in real terms (see Figure 4). Military expenditures from the metropolis are not counted (except in infrastructure and health). Cumulated net loans are the sum of amounts borrowed or received as advances minus amounts reimbursed, and of reimbursements received of amounts lent or advanced to others minus amounts lent or advanced. Residual is just the difference between the cumulated deficit and the two identified sources of financing, i.e. grants and loans. It includes other sources of funding like private transfers, or saving gains. Missing data were annually and linearly interpolated in real terms between the following start and end dates for each colony: Algeria 1833-1962; Tunisia 1891-1956; Morocco 1915-1956; Indochina 1871-1946; Madagascar 1901-1960; AOF 1905-1960; Togo 1920-1960; AEF 1904-1960; Cameroon 1922-1960. We are missing a few dates at the beginning (1830-33 in Algeria, 1881-1890 in Tunisia, etc.) and only the end of colonial period in Indochina (1947-1954).

Figure 5 shows the time evolution of metropolitan transfers both for civilian and military.

Even at its apex in the post-WW2 period, the financial contribution of the metropolis to civilian expenditures averaged at 0.5% of its own GDP, below the target fixed today by OECD for its members (0.7%) that is reached briefly on the year 1960.

Figure 5 – Metropolitan transfers, in % of metropolitan France GDP



Note: Civilian net grants include military expenditures in infrastructure and health. Military expenditures include personnel and operating expenses of troops, and other expenditures than infrastructure and health. Expenditures during the Indochinese and the Algerian liberation wars are rough estimates, likely to be underestimated in the case of Algeria. Missing data were annually and linearly interpolated in real terms between the following start and end dates for each colony (in parenthesis start data for civilian grants): Algeria 1833-1962; Tunisia 1881(1891)-1956; Morocco 1911(1915)-1956; Indochina 1870(1871)-1955(1946); Madagascar 1861(1901)-1960; AOF 1833(1905)-1960; Togo 1915(1920)-1960; AEF 1861(1904)-1960; Cameroon 1915(1922)-1960. For civilian grants, we are missing a few dates at the beginning, and only the end of colonial period in Indochina (1947-1955).

Military expenditures in the colonies are recorded in the metropolitan budgets of the two ministries of Navy/Colonies/Overseas (SSA and Indochina) and of War/Defense (NA and Indochina War). Expenditures linked to the war of Algeria (1954-1962) had to be estimated for they are not distinguished in the ministry of Defense accounts; they could be understated.⁶⁶ Figure 5 shows that military costs always lied much above civilian subsidies; they weighted on average 0.85% (vs. 0.15%) of metropolitan GDP over the 1833-1962 period, represented around half of civilian expenditures of colonies, and 6% of their own GDP. Of course these costs peaked in times of conquest wars (1830-50 in Algeria, 1880-1886 in Tunisia, Indochina, and Madagascar, 1920s and 1930s in Morocco) and during WW1 and WW2 due to indigenous conscription. Yet it is only after 1940 that they dramatically boom to levels much above 1% of

⁶⁶ We relied on Samir Amin's (1966) figures for metropolitan military expenditures in 1953, 1957 and 1960 Algeria, and interpolated other years based on the annual figures of army men (including conscripts) present in Algeria; expenditures in 1953 Tunisia are also from Amin and are kept constant in real terms until 1956, while in Morocco (until 1956) they are taken from balance of payments data, assuming that 90% of public expenditures paid by metropolis are for the military.

metropolitan GDP, reaching a first local maximum between 1951 and 1954 during war in Indochina (Tertrais 2002), then in 1958-1960 during war in Algeria but also in Cameroon.

However, the post-WW2 increase in military expenditure is not only driven by liberation wars. France also very much increased its military presence in Sub-Saharan Africa and after 1946 military spending also very much increases in Madagascar, AOF and AEF. The preservation of the Empire was not only turning costly in terms of subsidies to developmental or social expenditures, it was turning even more costly in terms of military. After the independences, France kept a few permanent military bases in former colonies, until 1961 in Morocco and Tunisia, and until today in Senegal and Gabon, yet withdrawal saved a lot of money on the military side.

The succession of conquest and pacification wars make it difficult to define a true “peacetime” in the colonial context; yet if we exclude WW1 (1914-1918) and all years after 1939 we still get military costs as high as 0.43% of metropolitan GDP, much higher than civilian transfers. In post-independence Morocco, after 1957, military expenditures appear in the domestic budget and weight 13% of total expenditures, or 25% in real terms of what was spent by the metropolis before the start of the Algerian war in 1953, or 1.5% of domestic GDP.⁶⁷ If we adopt the latter ratio to GDP (1.5%) to define a counterfactual military spending (absent colonialism), then the financing of military forces by the metropolis would have only represented a 0.21% transfer in terms of metropolitan GDP, bringing total metropolitan aid to $0.15+0.21=0.36\%$ over the 1833-1962 period. Overall, metropolitan transfers were definitely modest.

5. Conclusion

A novel data collection provides comparative evidence on colonial states of the ‘second’ French colonial Empire, since their foundation to their devolution in the 1960s. Colonial states were neither omnipotent Leviathans nor casual night watchmen. On the one hand, we emphasize the extractive efficiency and capacity of adaptation of colonial states to varied socioeconomic contexts and to varying historical conditions. On the other hand, we put forward dualism as the main common feature and legacy. For sure, apart from their biasedness and costliness, another characteristic was that colonial states were authoritarian and lacked legitimacy. Just after independence, legitimacy was greatly increased, yet their dualist features and international dependence persisted and gradually depreciated this initial capital and undermined authority. Some postcolonial states turned even more authoritarian to compensate (Algeria), others quickly faced political instability (Madagascar, Chad), while some managed their way more peacefully (Senegal), yet most of them were sooner or later contested in their capacity to generate shared development, that is to break with the dualistic structure, whatever the ideological orientation they claimed, pro-western or socialist.

Further works will make advances in two directions.

First, additional data collected on British colonies with the same methodology allow us to examine to which extent the same features held with a different colonizer. For West African colonies, it seems that common features dominate, in terms of size, tax and spending structure,

⁶⁷ 11.7 billion francs; Roy, du Maroc, *Tableaux économiques du Maroc 1915-1959*, p. 261. In contrast, according to Amin’s estimates (1966 pp. 281-284), Algeria in 1963 had the largest army in Africa, and spent 70 billion francs on it, meaning 5.2% of GDP, not even counting the pensions of veteran *moujahidins* (30 billion).

time sequence and metropolitan transfers. Colonizers' idiosyncrasies are only of second order, like higher spending on education on the British side. However, the tradeoff between wage levels and public employment seems to have been solved differently in each case, resulting in lower dualism and inequality in British colonies. To further our understanding, the Africanization of high rank administrative positions around independence will have to be analyzed more thoroughly.

Second, ongoing data collection will allow us to extend the analysis after the year 1970, until present times. Beyond the transition to independent countries, the critical junctures of socialist experiences then of structural adjustment policies will be studied, both from the taxation side and the spending side, together with the impact of the commodity boom and bust (1975-1985).

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Appendix – Estimates of the fiscal burden on Europeans and Autochthons

Income shares

Using income tax data from Alvaredo, Cogneau and Piketty (2017), we first devise estimates of the respective income shares of Europeans and of Autochthons, in 1925 and 1955. Jews in North Africa, Indian and Chinese minorities in Madagascar are merged with Europeans. Chinese in Indochina are treated as (urban) Autochthons, for they are many more than Europeans.

For NA in 1955, we adopt Samir Amin's (1966) estimates for the income shares of Europeans: 47% in Algeria, 43% in Tunisia and 37% in Morocco. These figures mean that the ratios of European average income to national average income are similar, respectively 7.8, 8.4 and 8.2. Data for 1956 (resp. 1946) Tunisia provide the income distribution of the top 33% (resp. 20%) Europeans. Data for 1945 Cameroon provide the income distribution of all Europeans. These data are used throughout to extrapolate the income earned by Europeans in all colonies.

For Algeria in 1925, we use income tax data for 1932. The top 3% income earners are estimated to earn 52% of total income, i.e. 17 times average income, and we consider they are all Europeans (or Jews) so that they represent the 20% richest Europeans. Combining Samir Amin's estimate for the average income of Europeans in 1955 Tunisia with the income of the 20% richest, we learn that the latter earn 1.76 the Europeans' average. To get at the Algeria figure, we then compute that Europeans in Algeria earn 9.6 (=17/1.76) times the average income, hence 62% of total income. We assume that the same ratio (9.6) holds for 1925 Tunisia and Morocco. Income tabulation tables for Indochina in 1925 provide us with the income earned by Europeans. They earn 80 times the average income hence get a 9% share of total income while being only 0.13% of total population. In 1945 Cameroon, Europeans make 0.1% of tax units and earn 73 times the average income. They represent the same population share in 1925 AOF hence we import this ratio of 73 and get a 6% income share. For 1925 Togo, AEF, Cameroon, and Madagascar, we also start from the 1945 Cameroon figure and use the 1946 Tunisian data and Pareto interpolation to estimate the income ratios to respectively 105. 87. 105 and 36. Last, for 1955 SSA, we apply the same Pareto interpolations using Tunisian data.⁶⁸

Next, we break down the autochthonous population in two social classes: "urban + rural non-poor" and "rural poor". Urban and rural non-poor Autochthons will pay a significant share of direct and indirect taxes, of import tariffs, as well as buy a significant share of state-provided services and goods. Rural poor will be mostly subsistence farmers paying the capitation, a tiny share of imports and excise taxes, and export taxes on agricultural commodities.

For 1955 NA, Samir Amin (1966. pp. 114-119) provides population and income shares for urban and rural Muslims in each NA colony. Furthermore, he distinguishes (p. 185) a fraction of rich farmers who make 7% of rural population and earn one third of total rural income; we aggregate them to the urban population. For 1925 NA, the urbanization rate of Muslims is drawn from the 1926 population census in Algeria, and is also adjusted for the (assumed equal to 1955) 7% share of non-poor farmers in rural areas. The average income of rural poor is extrapolated backward to 1925 using the Autochthons' income per capita growth rate (hence assuming that income distribution did not change among Autochthons); the average income of the non-poor Autochthons is then computed as a residual.

⁶⁸ We tried an alternative simpler estimation procedure where we disregard Cameroon income tax data and use only the Tunisian distribution, assuming that Europeans earn the same income everywhere. Results were very similar, one exception being Togo.

For SSA countries in 1925, we use 1945 Cameroon tax data and infer that indigenous personal income tax and trade licenses' payers are 15 times as many as Europeans, meaning only 1.4% of Autochthons; we adopt twice this figure to account for unregistered rural non-poor. In Indochina all Chinese are considered to be urban, on top of 4.3% of urban Indochinese, so that our estimate is doubled to 5.5%. The same figure is applied to Madagascar. For 1955, a 10% urbanization rate is assumed, which is roughly consistent with World Bank data for 1960.

In all colonies outside of NA, we assume that the rural poor earn a fixed subsistence income per capita, that we estimate for the year 1925 as the price of a yearly ration of 1.600 kcal of rice in 1938 Madagascar (or Indochina. the two figures being almost the same). For the year 1955 we increase this figure by the growth rate of average autochthonous income (i.e. slightly above 50%) to reflect agricultural productivity gains linked to the take-off of cash export crops. In both years, the average income of the non-poor class is then computed as a residual.

Table A.1 summarizes the results of this tentative estimation procedure.

Table A.1 - Income distribution estimates for the years 1925 and 1955

	NA	Indoch.	Madag.	WCA
Year 1925				
Europeans: Population share (%)	9.2	0.1	0.8	0.1
Income share (%)	50.0	9.1	22.8	5.9
Average income (FF 1937 PPP)	10,193	46,083	19,433	40,299
Urban & Rural Non-Poor: Pop. (%)	16.9	5.5	5.5	2.8
Income share (%)	26.3	30.7	22.7	23.1
Average income (FF 1937 PPP)	2,912	3,517	2,870	4,501
Rural Poor: Population (%)	73.9	94.4	93.7	97.1
Income share (%)	23.7	60.2	54.6	71.0
Average income (FF 1937 PPP)	603	404	404	404
Year 1955				
Europeans: Population share (%)	8.1		1.5	0.4
Income share (%)	41.1		24.4	13.1
Average income (FF 1937 PPP)	12.232		18.149	33.204
Urban & Rural Non-Poor: Pop. (%)	22.0		9.8	10.0
Income share (%)	32.7		24.7	26.2
Average income (FF 1937 PPP)	3.566		2.804	2.422
Rural Poor: Population (%)	69.9		88.6	89.7
Income share (%)	26.1		50.8	60.7
Average income (FF 1937 PPP)	896		641	624

Source: Income tax tabulation data from Alvaredo, Cogneau & Piketty (2017). See text for other sources.

Notes: Europeans include Jews in NA. and Indians and Chinese in Madagascar. Chinese in Indochina are in urban autochthons.

We then make additional assumptions to get at estimates of the fiscal burden endured by each of the three groups

Tax rates

We make “conservative” assumptions in order not to underestimate the fiscal burden of the Autochthons. We believe the assumptions made provide an upper bound for the taxes paid by this group. We are aware that tax incidence analysis is difficult, in particular for indirect taxes (e.g. Atkinson & Stiglitz. 1982); we acknowledge that we lack the statistical basis (social accounting matrixes) and a well-founded equilibrium model to perform a proper one. For capitation, we consider that each group pays proportionally to its population share. Hence in proportion of income, the burden of capitation will overwhelmingly weight on rural poor Autochthons. For imports, we assume that the latter only “consume” 2.5% of their income in imported goods in 1925, 5% in 1955 to reflect the increased openness of economies. The residual imports are “consumed” by the two other groups. We make the extreme assumption that non-poor Autochthons consume the same share of their income in imports as Europeans. Then we apply to both groups the colony’s average tax rate on imports. For export taxes, we make the extreme assumptions that the rural poor pay them all, when they produce coffee, groundnuts or cocoa in West or Central Africa, or when they collect rubber in Indochina or vanilla in Madagascar. For monopolies and intermediate taxes, we assume that the rural poor have a propensity to consume taxed goods that is one twentieth of non-poor in 1925, one tenth in 1955 (these proportions are meant to be similar to the assumption on imports); non-poor autochthons are taxed at the same rate as Europeans. Last, for modern taxes, we assume that the rural poor pay none, excepting the *tertib* in Morocco, and that Europeans and non-poor Autochthons endure the same rates.

Table A.2 - Estimates of tax rates on income

	NA	Indoch.	Madag.	WCA
Year 1925				
Europeans	8.9	23.6	12.8	12.2
Autochthons	6.2	11.2	9.1	5.4
Urban or Rural Non-poor	10.1	23.9	13.5	12.2
Rural poor	1.9	4.8	7.3	3.1
All	7.5	12.4	9.9	5.8
Year 1955				
Europeans	20.4		21.1	23.8
Autochthons	11.6		12.5	12.3
Urban or Rural Non-poor	19.1		21.9	24.5
Rural poor	2.2		7.9	7.1
All	15.2		14.6	13.8

Source: See text.

Notes: Europeans include Jews in NA. and Indians and Chinese in Madagascar. Chinese in Indochina are in urban autochthons.

Public Finances in the French Colonial Empire

Data Appendix

Denis Cogneau, Yannick Dupraz & Sandrine Mesplé-Somps

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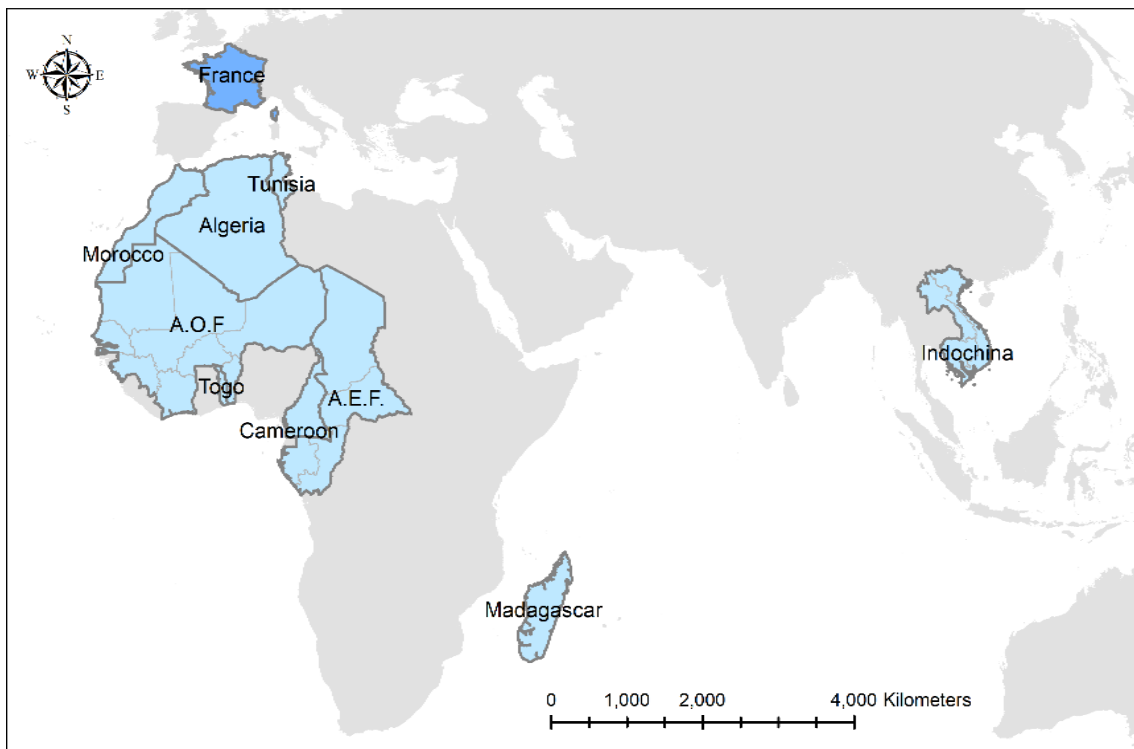
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EXTENT OF THE PUBLIC FINANCE DATABASE

GEOGRAPHICAL AND HISTORICAL RANGE

Geographical range. Our database covers almost the entire second French colonial empire, corresponding to the second wave of European colonisation from the middle of the 19th century. Except the Indochinese Union, most colonies are in Africa: Algeria, Tunisia and Morocco, the federations of French West Africa (*Afrique occidentale française*, A.O.F.) and French Equatorial Africa (*Afrique Equatoriale Française*, A.E.F.), Togo, Cameroon, and

Figure 1: Geographical extent of the dataset



Madagascar (see map on figure 1). Our database does not encompass smaller colonial territories such as the remains of the first colonial empire (Guadeloupe and Martinique in the West Indies, French Guyana, the Reunion Island and the five trade posts of India), New Caledonia, colonized by France in 1853, and the port of Djibouti, colonized in 1884. Lebanon and Syria, under French rule between the two world wars, are not included in the present database either, and will be the object of future research. In total, the former French colonies that are part of our database correspond to 21 contemporary countries: Algeria, Morocco, and Tunisia in North Africa, Benin, Burkina- Faso, Cameroon, Chad, Central African Republic, Congo-Brazzaville, Côte d'Ivoire, Gabon, Guinea, Madagascar, Mali, Mauritania, Niger,

Senegal and Togo in Sub-Saharan Africa, and Vietnam, Laos and Cambodia in South-East Asia.

Table 1: Historical range of the dataset

Region	Range of colonial data	# observations	Range of Franc Zone data	# observations
Algeria	1833-1958	96	1959-1969	11
Morocco	1926-1956	27	1957-1969	13
Tunisia	1891-1955	61	1957-1969	10
Indochina	1871-1946	39		
West Africa ^(a)	1905-1958	18	1959-1967	8
Equatorial Africa ^(b)	1904-1954	22	1958-1970	13
Cameroon	1922-1957	28	1958-1970	13
Madagascar	1901-1956	52	1958-1970	13
Togo	1920-1955	14	1958-1970	13

(a) The West African federation includes Côte d'Ivoire, Dahomey (present Benin), Guinea, Haute-Volta (present Burkina-Faso), Mauritania, Niger, Senegal and Soudan (present Mali).

(b) Equatorial Africa includes Chad, Congo (present Congo-Brazzaville), Gabon, Oubangui-Chari (present Central African Republic)

Historical range. For each territory, the starting date depends on the specific history of colonization in the region and on the date at which colonial authorities started producing systematic records of public finances. The first region to be colonized was Algeria, whose conquest began in 1830, the last were Togo and Cameroon, who were given to France as League of Nation mandates after WWI. The end date also depends on the specific history of each region. In Indochina, our database stops in 1946, the year the independence war began. For African colonies, which became independent between 1956 (independence of Morocco) and 1962 (independence of Algeria after an eight year war), we are able to extend the database to the end of the 1960s, using the reports of the Franc Zone, the monetary union between France and some of its former colonies. Since the 1950s, the *Banque the France* in charge of the monetary policy of the Franc Zone has been publishing reports containing some information on the public finances of its member countries. These reports offer a picture of public revenue and expenditure less detailed and complete than the one built using budget accounts directly. Table 1 sums up, for each of the 9 regions considered, the historical range of our public finance data, distinguishing between the “colonial” dataset, built primarily from

budget accounts, and the “Franc Zone” dataset, built primarily from the reports of the Franc Zone.

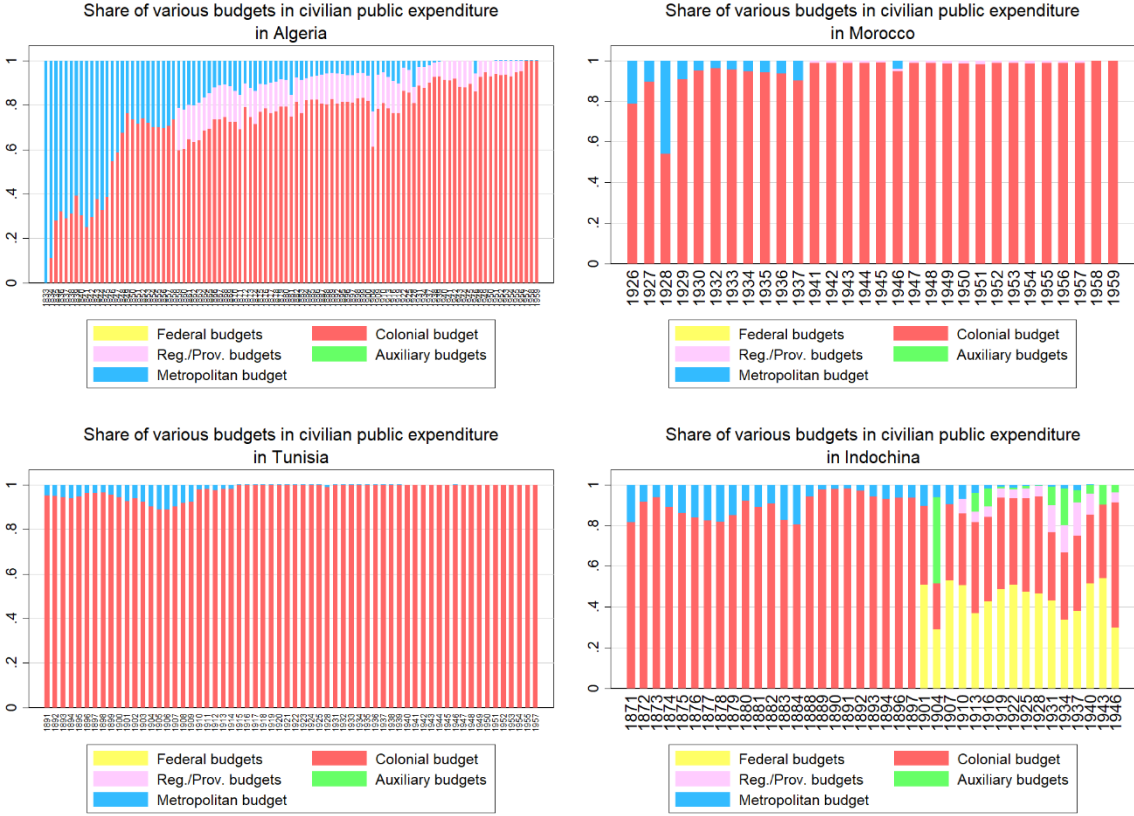
BUDGET ACCOUNTS CONSIDERED AND SOURCES USED

This section presents the budget accounts considered and the sources used to build the public finance database, as well as the main assumptions made, especially when dealing with missing data. The complete list of sources is displayed in the “Public finances” section of the “List of sources” below. In order to produce figures comparable across time and across regions, we did not only consider the central colonial governments, but tried to collect data for all public authorities responsible for revenue and expenditure in the colonies. This requires detailed knowledge of the administrative structure of the Empire. We collected data from various budget accounts: metropolitan (French), colonial, federal in colonies organised in federations, auxiliary (loan budget accounts, development funds, etc.), as well as the accounts of lower level administrative divisions. For each year and each region of the Empire, these budgets are consolidated, meaning that the various transfers between them (subsidies, loans, interests and reimbursements) are cancelled out to avoid double counting of revenue and expenditure items.

Metropolitan budget accounts. In mainland France, two ministries were responsible for the majority of spending in the colonies: The Ministry of the Navy and the Colonies (*Ministère de la Marine et des Colonies*), and the Ministry of War (*Ministère de la Guerre*). Military expenditure in the colonial Empire were the responsibility of these ministries (the ministry of war dealt with North Africa, the ministry of the colonies with the rest of the Empire). Military expenditure therefore never appear in the colonial budget accounts, except in Algeria between 1830 and 1900 (and between 1904 and 1937 for the Southern Territories only), and in Morocco until 1937, and again in 1956 in preparation for independence. It is not obvious whether colonial military expenditure of metropolitan budget accounts should be considered an item of expenditure for the colonies. On the one hand, countries started developing a national defense budget once they became independent, and colonial military expenditure could be partly considered as France mutualizing the cost of national defense. On the other hand, the military conquest and domination of a colonial empire should be considered mainly an item of expenditure for France, the colonizing power. Additionally, military expenditure of the Ministry of Colonies include the payment of colonial troops who contributed to France’s national defense by fighting in Europe during WWI and WWII. In the end, we exclude military expenditure from our public expenditure aggregate, and make

colonial military expenditure available separately (see “Variable dictionary” below). However, our public expenditure aggregates do comprise expenditure of the Ministries of War and Colonies that can be thought of as civilian in nature, namely subsidies to private companies, and infrastructure and health expenditure. Only during the period of conquest, and

Figure 2: Share of various budgets in civilian public expenditure (North Africa and Indochina)



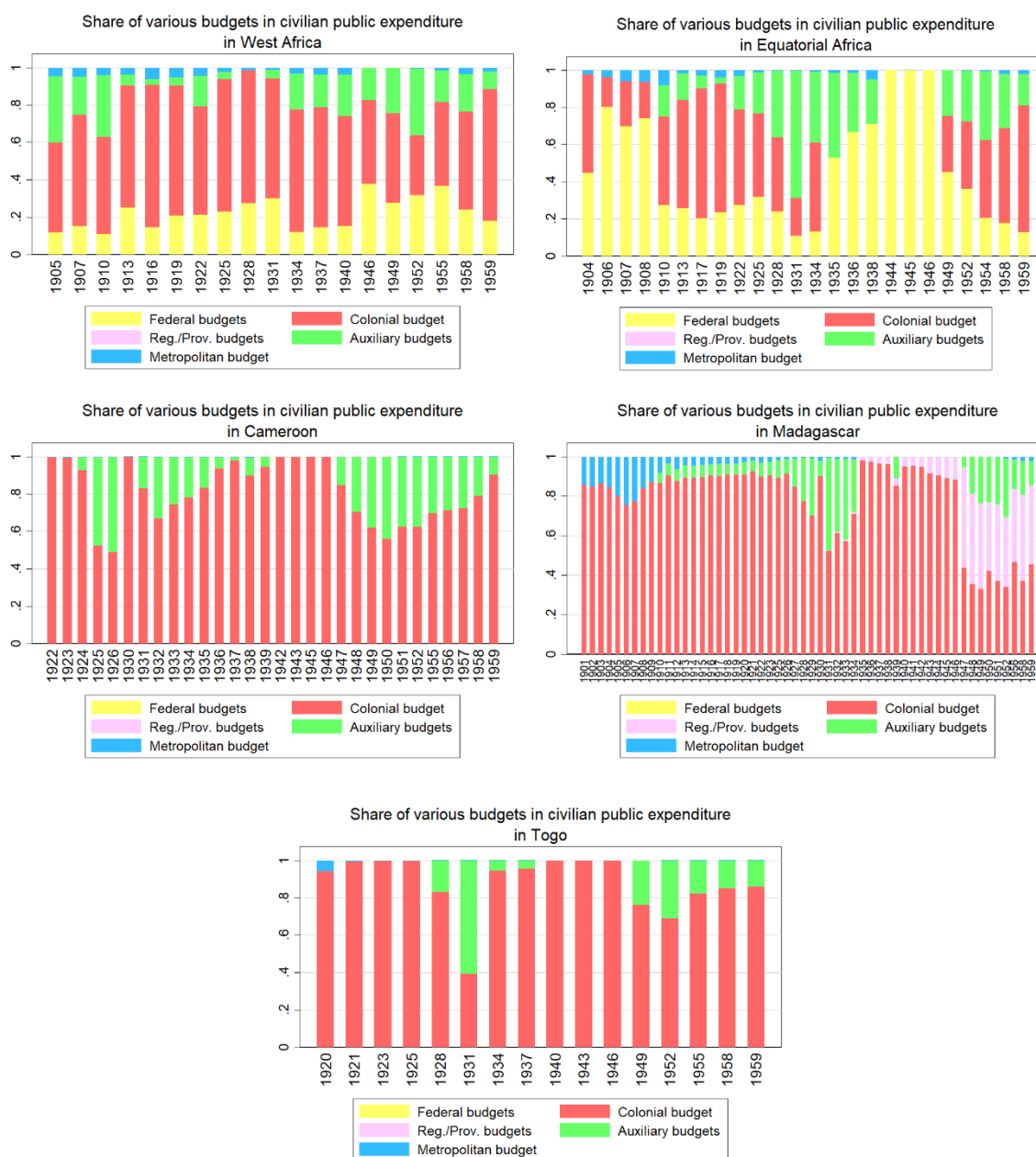
Note: the quasi-absence of auxiliary budgets in North Africa (Algeria, Morocco, Tunisia) reflects the fact that, in these colonies, auxiliary and colonial budgets were often presented alongside each other and were merged during data collection.

in Indochina, did these metropolitan expenditure represent more than a couple of percentage points of our aggregate civilian expenditure figure (see figures 2 and 3). Only part of these metropolitan civilian expenditure can be allocated to a given region of the empire. We allocated the rest in proportion of the share of each region in allocated expenditure.¹ On the revenue side, we consider these as direct subsidies from France to its colonies.

¹ The share of each region in allocated expenditure was computed over 10-year periods. In the budget accounts of the Ministry of the Colonies, regional allocation is not known at all between 1932 and 1959. We use allocated expenditure using the regional allocation of the 1920s. In the budget accounts of the Ministry of War, figures are aggregated for Tunisia and Algeria in 1915, 1921, 1928-1929 and 1933-1937: we allocate between Tunisia and Algeria using average allocation in the 1920s. In 1938 and 1939, figures are given for the whole of North Africa. We allocate between Algeria, Tunisia and Morocco using average allocation in the 1920s.

From 1958 to 1962, one metropolitan ministry was in charge of the Sahara region (*Ministère du Sahara*). This budget has been added to the Algerian budget account. There were also other ministries that were responsible for Morocco and Tunisia (*Ministère des affaires marocaines et tunisiennes*, 1955-1959) as well as for Algeria (*Secrétariat d'Etat aux affaires algériennes*, 1958-1963). These budgets have not been added as they appear directly in the colonial budgets.

Figure 3: Share of various budgets in civilian public expenditure (Sub-Saharan Africa)



Federal structure. Three regions of the empire, Indochina, French West Africa (*Afrique Occidentale Française*, A.O.F.) and French Equatorial Africa (*Afrique Equatoriale Française*, A.E.F.), were organized in federations. The Indochinese Union became the Indochinese Federation in 1946 and was dissolved in 1949. The A.O.F. and A.E.F. were dissolved in 1958-59.² These federations were organized in a pyramidal structure, with

² Indochina was divided in three “Associated States” (Cambodia, Laos, and Vietnam). Colonies of A.O.F. and A.E.F. became autonomous Republics belonging to the French Community, a political association of France and its former African colonies, except Guinea which became independent in 1958. The French Community was dissolved in 1960 when all French colonies south of the Sahara gained independence.

colonial governments (*Gouvernements locaux*) in each colony, responsible for local revenue and expenditure, and a federal government (*Gouvernement général*) responsible for general interest spending (mostly in infrastructure and administration) and financed mostly by custom duties and rents on government monopolies. Within a federation, there were many financial transfers (loans, advances, subsidies) between the different colonies and the federal government. Federal revenue and expenditure represented a large share of total revenue and expenditure (see figures 2 and 3 for the expenditure side). For that reason, we consider these federations as a whole and do not attempt to reallocate federal revenue and expenditure to the different colonies that were to become autonomous republics or independent countries. In a given federation in a given year, consolidated expenditure (revenue) is obtained by summing expenditure (revenue) in the federal budgets and the various colonial budgets, cancelling the transfers within the federation.³ Though the federations of A.O.F. and A.E.F. were dissolved in 1958, there was residual expenditure and revenue until 1959, recorded in the Franc Zone report for 1959 (France, Comité monétaire de la zone franc, 1959). In the same report we found the revenue and expenditure of the short-lived Mali Federation, which united Mali and Senegal between 1959 and 1960.

Auxiliary budgets. Infrastructure projects financed by loans were often registered on separate auxiliary budgets. Ports, railways, and the health sector also sometimes saw their expenditure and revenue recorded in a separate budget. Because railway companies were not always public, we did not collect data from the auxiliary budgets of railways. In the case of a public railway company, excess revenue was transferred to the colonial budget and is taken into account in our data (in the category “Monopoly revenue”, see “Variable dictionary” below), subsidies to the railway company were also recorded in the colonial budget and are taken into account in our data (in the category “Production support”). Capital expenditure for the construction of railway lines was mostly financed publicly and appears in the colonial budgets rather than the railway budgets. Posts and telegraphs, which were always public, are fully taken into account in our aggregates: their receipts are in the variable “Monopoly revenue”, and their expenditure in the variable “Production support”.⁴ As for the various

³ Each colony of a federation had its own colonial budget, except in A.E.F. between 1935 and 1945, where all revenue and expenditure items were written in the federal budget.

⁴ The receipts and expenditure of the posts and telegraphs are usually recorded in the colonial budget, but in Algeria from 1925, they are recorded in a separate budget, available at the *Bibliothèque nationale de France* between 1925 and 1939. We rely on the summary provided in the statistical yearbooks afterwards (see “List of sources”).

development plans established in the 1950s, their accounts sometimes appear directly in the colonial budget, as is the case for the Constantine plan in Algeria, and are sometimes recorded in special budgets managed directly by France, as is the case for the special development fund created for Sub-Saharan Africa, the FIDES (*Fonds d'Investissement pour le Développement Economique et Social*). The expenditure of the FIDES in each year and each colony was found in a retrospective document published by IEDES (1964). On the revenue side, because the FIDES was financed only by contributions from France and from the colonies, we were able to reconstitute the French subsidy by subtracting the colonies' contributions from the total expenditure.⁵

First and second-level administrative divisions. Below the colony (corresponding to present-day countries), we consider first-level (districts) and second-level (municipalities) administrative divisions. The level of decentralization of public expenditure varied within the French colonial Empire. It was very low in West and Equatorial Africa, and more important in North Africa, Madagascar, and Indochina.

Our figures always take into account first-level administrative divisions. Algerian *départements* (district) started having distinct budgets in 1859, Malagasy *provinces* in 1931, and Moroccan *régions* in 1939. In Indochina, we use the provincial budget accounts of Cochinchina from 1910 on, and all provincial budgets starting in 1931, when a number of items of revenue and expenditure were decentralized from colonial to provincial budgets. In Tunisia, A.O.F., A.E.F., Togo, and Cameroon, first-level administrative divisions (districts) did not have budgets of their own. We can see on figure 2 and 3 that the share of first-level administrative divisions in total expenditure was significant only in Algeria, Indochina, and Madagascar. In Madagascar, the contribution of provincial budgets to total public expenditure became particularly important after the decentralization reform of 1946, reaching 50% in some years.

Second-level administrative divisions (municipalities) had distinct budgets in North-Africa and Indochina. In Sub-Saharan Africa, no municipality was empowered to raise revenue and allocate expenditure before 1955, with the exception of the four Senegalese *communes* which obtained the same status as metropolitan municipalities: Saint-Louis and Gorée (in 1872), Rufisque (in 1880), and Dakar (in 1887). In 1955, 44 new municipalities were created in A.O.F., A.E.F., Madagascar, Cameroon and Togo.⁶ We found some budget

⁵ The French contributions are also recorded in the French budgets, but in a less systematic way.

⁶ France. *Journal officiel de la République française du 19 novembre 1955*. Paris: Imprimerie des Journaux officiels, 1955, p. 11274. https://www.legifrance.gouv.fr/jo_pdf.do?id=JORFTEXT000000313008

accounts for second-level administrative divisions, but our series are patchy and incomplete. They are therefore not included in our main aggregates, though we make them available in a separate variable (see “Variable dictionary”). Table 2 displays the share of municipalities in total public expenditure and revenue for North Africa, West Africa, Indochina, and France. Municipalities were particularly important in North Africa. In 1955 for instance, they represented 7.5% of revenue in Tunisia, 11.4% in Morocco, and 24.4% in Algeria. In the rest of the Empire, municipalities did not weigh as much. In 1925, they represented 0.2% of revenue and less than 5% of expenditure in West Africa, and about 1% of expenditure and revenue in Indochina (we could not find data for 1955).

Table 2: Share of municipalities in total net expenditure and revenue

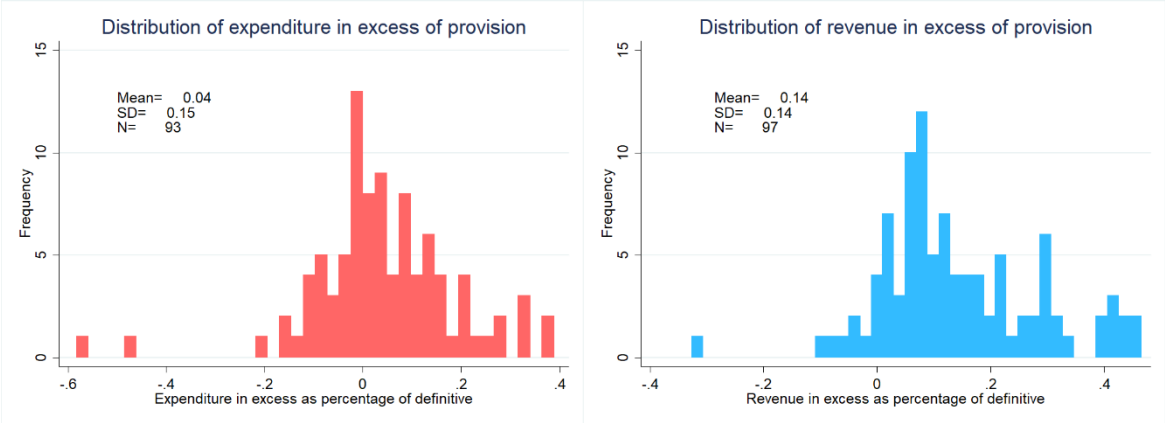
	1925		1955	
	Share in expenditure	Share in revenue	Share in expenditure	Share in revenue
Algeria	23.4%	20.5%	21.2%	24.4%
Morocco	na	na	7.8%	11.4%
Tunisia	9.3%	13.7%	6.3%	7.5%
West Africa	4.9%	0.2%	na	na
Indochina	1.1%	1.0%	na	na
France	33.1%	na	13.6%	na

Sources for France: André et Delorme (1983), INSEE (1966)

Definitive and provisional accounts. Several types of documents were produced during the budget process: provisional accounts (usually called “*Budgets*”) were previsions produced in advance of the fiscal year, while definitive accounts (usually called “*Comptes définitifs*”) were published after the end of the fiscal year and recorded the actual amounts collected and spent. Whenever possible, we rely on definitive accounts, but use provisional accounts in a few years when definitive accounts are missing. Provisional accounts are typically much more detailed, and notably contain information on wages and the number of employees, which is why we also use them to collect information on average public sector wages and the size of the civil service (see “Personnel data” below). For the 97 colony-years in common between the two datasets, we can check the discrepancy between provisional and definitive accounts: provisional accounts underestimate final expenditure by 4% on average and final revenue by 14% on average (figure 4). When provisional or definitive accounts are

not available, we sometimes use Statistical Yearbooks (*Annuaire Statistiques*) or other official publications, which present definitive figures (see the “list of sources” below).

Figure 4: Distribution of revenue and expenditure in excess of provision



Postcolonial data. To extend the dataset to the colonial period, we use mainly the reports of the Monetary Committee of the Franc Zone (Comité Monétaire de la Zone France, various dates), and the OECD development assistance committee (OECD-DAC) data (OECD, 2017). The information contained in the Franc Zone reports is not as detailed as the information contained in the budget accounts of various colonies. In consequence, after independence, aggregate revenue net of subsidies and loans cannot systematically be broken down into different tax instruments, and aggregate expenditure net of subsidies and loans cannot systematically be broken down into different sectors. Guinea gained its independence from France in 1958 and cut ties with the former colonizer, refusing to be part of the monetary union headed by France. As a result, Guinean public finances are not recorded in the Franc Zone reports, and we use the figures given in Amin (1971) instead.

One other important limitation of the Franc Zone reports is that they do not systematically take into account the budgets of various development funds. This is not a problem to estimate fiscal revenue, as these funds were typically financed by loans and aid, but this is a problem to estimate net expenditure. Table 3 compares development (capital) expenditure in the few development plans budget accounts we were able to find with development expenditure in the Franc Zone reports in the corresponding years. Franc Zone reports appear to systematically miss a large share of development expenditure, about half in Senegal (1969) and Madagascar (1964-1966), more than 80% in Haute-Volta (present-day Burkina Faso) between 1967 and 1970.

Table 3: Development expenditure in the 1960, comparison of different sources

(current FCFA billions)	Development plan ⁽¹⁾	Franc zone report ⁽²⁾
Senegal (1969)	10.92	4.66
Haute-Volta(1967-1970)	19.76	3.30
Madagascar (1964-1966)	39.38	21.52

(1) *Sources*: Haute-Volta, Direction du plan et des études de développement (1971); Madagascar, Commissariat général au plan (1965-69); Sénégal, Secrétariat d'Etat au plan (1972).

(2) *Sources* : Comité monétaire de la Zone Franc (various dates)

To approximate development expenditure in the 1960s, we assume that they were mostly financed by international aid (grants and loans) and complement the Zone Franc reports with the OECD-DAC dataset. Net public expenditure in a given country after 1960 is computed as total expenditure minus debt service as recorded in Franc Zone reports, minus all external loans and subsidies received by the country recorded in the Franc Zone report (except when we know these emanate from a private source or a non-OECD country), plus net OECD ODA (loans and grants) received by the country.⁷ This does not affect our measure of net revenue, which is simply the sum of fiscal revenue and revenue of industrial operations, domains and monopolies recorded in the Franc Zone reports.⁸

There are other discrepancies between the series built using colonial budget accounts and the postcolonial series. Franc Zone reports do not record the auxiliary accounts of parastatal sectors such as posts and telecommunications. In Tunisia between 1961 and 1966, we were able to take into account the expenditure and revenue of the posts and telecommunications service recorded in the statistical yearbook of Tunisia 1964-1965 (Tunisia, Secrétariat d'Etat au plan et aux finances, 1964-1965). Franc Zone reports do not always take into account the revenue and expenditure of first-level administrative divisions. It is an important concern for Madagascar only, where the share of provinces in total public expenditure and revenue was quite high in the 1950s (see figure 3, panel 4). Malagasy provincial accounts are recorded in the Franc Zone reports until 1960. Between 1963 and

⁷ On top of aid to individual countries, the OECD-DAC dataset records regional aid allocated to world regions such as “Africa, South of Sahara” or “Africa, North of Sahara.” We allocate regional aid to each individual country in proportion of its share in total allocated aid. Before 1964, French aid to Sub-Saharan Africa is not broken down by individual countries at all. We allocate it to each individual country in proportion of its share in 1964 total allocated French aid to Sub-Saharan African countries.

⁸ As Franc Zone reports become less precise in the end of the 1960s, the revenue of industrial operations, domains and monopolies often becomes missing (fiscal revenue is always given). To avoid a break in the series, we extrapolate the revenue of industrial operations, domains and monopolies using their share in total net revenue the last year it was available.

1966, we find them in Madagascar, Commissariat général au plan (1965-1969). Other years are extrapolated (see “Missing data” below).

MISSING DATA

This section details the different assumptions and extrapolations made in order to consolidate various data and avoid breaks in statistical series when particular budget accounts could not be found.

Colonial budget accounts. For Algeria, Morocco, Tunisia, Indochina, Madagascar and Cameroon, we set up the goal of collecting data at an annual frequency, though we sometimes could not find budget accounts for a particular year. For the two African federations (A.O.F. and A.E.F.), we collected federal budget accounts (*budgets généraux*) every year, but colonial budget accounts (*budgets locaux*) every three years only. We also collected data on Togo every three years only. Aggregating expenditure and revenue at the level of the federation (A.O.F., A.E.F., and Indochinese Union) requires having the budget accounts of all the colonies of the federation in a given year. When we could not find the budget account of a colony, we used the account of an adjacent year.⁹ In rare cases, we could not find adjacent years: budget accounts of the colony of French Soudan (A.O.F., present day Mali) are missing between 1922 and 1928 and in 1946, the budget accounts of Gabon (A.E.F.) are missing in 1947 and 1949, and the one of Oubangui-Chari (A.E.F.) is missing in 1954. In these cases, we make an educated guess for the revenue and expenditure of the missing colony using its share in the total revenue and expenditure of the federation in a close enough year.¹⁰ For French Soudan in 1946, we know total revenue and expenditure (recapitulated in the 1949 budget), and we break them down into different items of revenue and expenditure using the distribution of 1949. We could not find the budget accounts of Haute-Volta in 1958, but we use the information recorded in the Franc Zone report for that year. We infer the sectoral allocation of expenditure, not given in the Franc Zone report, using the allocation of 1956.

⁹ In A.O.F., affected years and budget accounts are: *budget général* (1957 instead of 1958), Côte d’Ivoire (1917 instead of 1916 and 1926 instead of 1925), Dahomey (1944 instead of 1943 and 1957 instead of 1958), Haute Volta (1920 instead of 1919, 1929 instead of 1928, and 1954 instead of 1955), Niger (1942 instead of 1943), Senegal (1957 instead of 1958), French Soudan (1932 instead of 1931), Togo (1923 instead of 1922, 1947 instead of 1946, 1950 instead of 1949, and 1956 instead of 1955). In A.E.F.: *budget général* (1903 instead of 1904), Gabon (1953 instead of 1954), Oubangui-Chari (1912 instead of 1913), Tchad (1912 instead of 1913). In Indochina: CochinChina (1906 instead of 1907), Laos (1897 instead of 1896 and 1902 instead of 1901).

¹⁰ We use the shares of 1919 for French Soudan 1922 and 1925, the shares of 1931 for French Soudan 1928, the shares of 1955 for Togo and Haute Volta 1958, and the shares of 1952 for Gabon 1947 and 1949, and Oubangui-Chari 1954.

There is some missing information in Morocco's special budget ("*Budget spécial*", an investment budget accounting for an average 7% of total expenditure). Between 1926 and 1931, and in 1953, our source gives only revenue, and not expenditure. We set expenditure equal to revenue. Between 1932 and 1937, our source gives only the total expenditure of the special budget, and the sectoral allocation is not given. Between 1926 and 1937, we use the sectoral allocation of 1938. In 1953, we use the sectoral allocation of 1952.

Metropolitan budget accounts. In Metropolitan budget accounts, we collected every year systematically from 1870 onwards only. Before this date, data was collected every 3 years for the Ministry of War, and every 10 years for the Ministry of the Colonies. This affects only Algerian data, for which our series start in 1833. After 1870, a handful of budget accounts were missing for the metropolitan ministries.¹¹ In order to have consistent estimates, we used linear interpolation to fill in missing years. After 1939, budget accounts of the Ministry of War are missing for all years except 1946. We do not try to extrapolate missing data in this period. Contributions of metropolitan ministries are only important in the early colonial period (especially in Algeria), and gradually lose importance over time, as can be seen in figures 2 and 3.

First-level administrative divisions. We use linear interpolation to fill in gaps in our public finance series for first-level administrative divisions: Malagasy *provinces* between 1932 and 1937 and between 1960 and 1963, Cochinchinese *provinces* between 1923 and 1930, Algerian *départements* between 1938 and 1948, Moroccan *régions* between 1940 and 1944 and between 1946 and 1948. These assumptions are quite innocuous to our final aggregates because, except in Madagascar after WW2, these budget accounts never represent a large share of total public expenditure and revenue (figures 2 and 3). In Madagascar in 1952, the budget accounts of the province of Tananarive are missing: we make an educated guess using the share of Tananarive in total provincial expenditure and revenue in 1951. We extrapolate the revenue and expenditure of Malagasy provinces between 1967 and 1970 by assuming that the share of provinces in total revenue and expenditure was the same than in 1966.

For Algerian *départements* between 1859 and 1889, our source gives us only aggregate expenditure and revenue. We infer the fiscal structure and sectoral allocation of expenditure using the distribution of 1892.

¹¹ Missing years are, for the Ministry of the Colonies, 1884, 1888, 1889, 1892, 1893, 1900, 1951 and 1952, and, for the Ministry of War, 1877-1879, 1889, 1892, 1906, 1916-1920, 1930, and 1931.

In the budget accounts of Malagasy *provinces* between 1947 and 1951, some items of revenue are missing (indirect taxes, revenue of industrial operations and administrative services). We infer them using their shares in total revenue in 1952 (1956 for the province of Tananarive).

Aggregation for the whole French colonial empire. We provide estimates for the whole French colonial empire every three years between 1904 and 1937, and in 1946, 1952, and 1955. These aggregate figures always exclude the smaller colonies that are not part of the database (see above), as well as Togo before 1919, Cameroon before 1922, Morocco before 1925, and Indochina after 1946. When we do not have the budget accounts of a given colony in a given year, we use the budget accounts of an adjacent year.¹²

Post-independence budget accounts. Post and telegraph accounts were missing from 1958 to 1960 in Tunisia, we use the share of this budget in 1961 to estimate it during these previous years.

PERSONNEL DATA

Provisional budget accounts are usually more detailed than definitive accounts, which allows us to collect some personnel data, such as total number of employees and total personal expenditure per sector. Because counting the total number of employees represents an important collection effort, we limited ourselves to 5 dates as close as possible to 1913, 1925, 1937, 1949, 1955, and 1960.¹³ In each sector, we computed the average wage by dividing total personnel expenditure by the number of employees. We also tried to collect 5 specific wages in a systematic way: the governor's wage, wages of the highest and lowest paid nurse, and wages of the highest and lowest paid teacher.

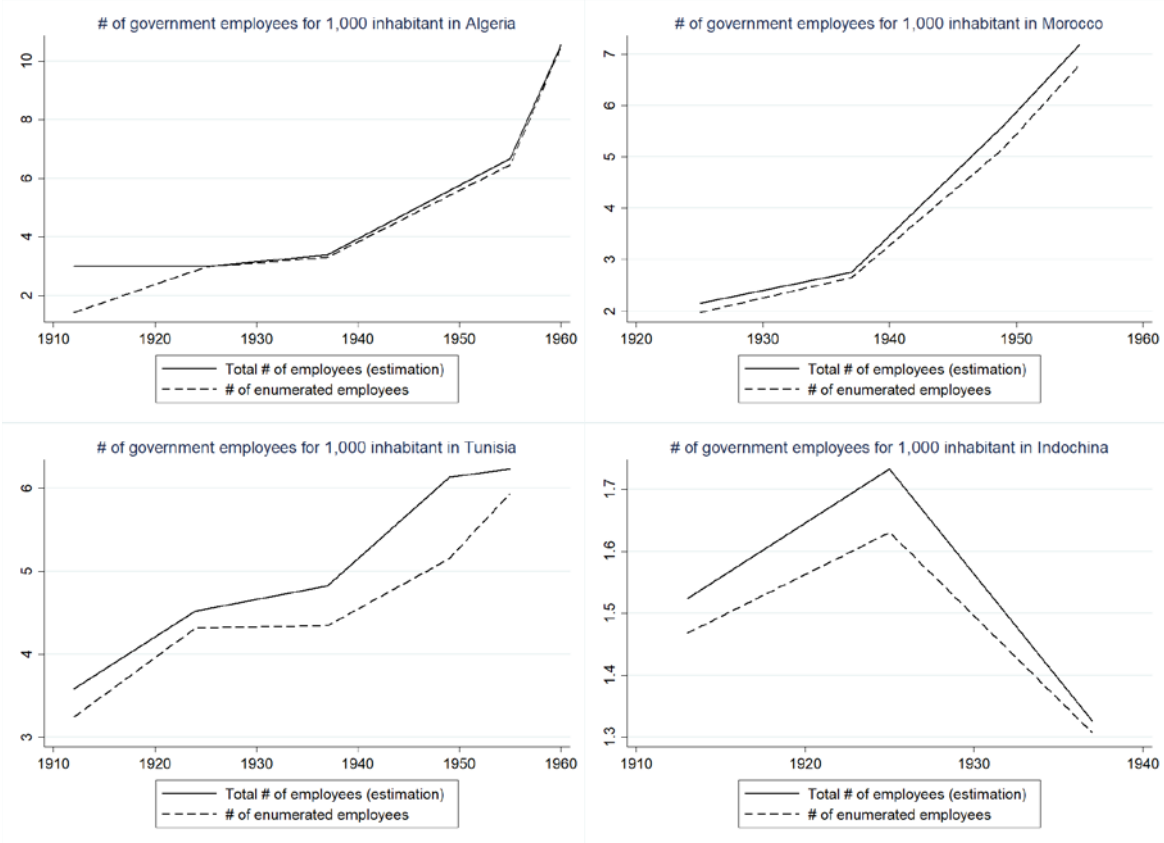
Provisional budget accounts are very detailed and personnel expenditure can in the majority of cases be matched to an exact number of workers, so that the average wage can be computed. However, some items of personnel expenditure are not attached to a precise number of employees. In that case, we infer the corresponding number of employees by dividing the monetary amount by the average wage of the sector, or, when we can infer that these are low-paying jobs such as servants or manual workers, by the average of the lowest wages in the education and health sectors. Figure 5 and 6 display for each region the number of government employees enumerated in the budget accounts and the number of government

¹² We use 1909 instead of 1907 in Algeria; 1926 instead of 1925 and 1932 instead of 1931 in Morocco; 1905 instead of 1904 in A.O.F.; 1938 instead of 1937 and 1954 instead of 1955 in A.E.F.; 1930 instead of 1928 in Cameroon; 1951 instead of 1952 and 1956 instead of 1955 in Madagascar.

¹³ Only dates before World War II for Indochina.

employees according to our computations. The discrepancy between the two series is never

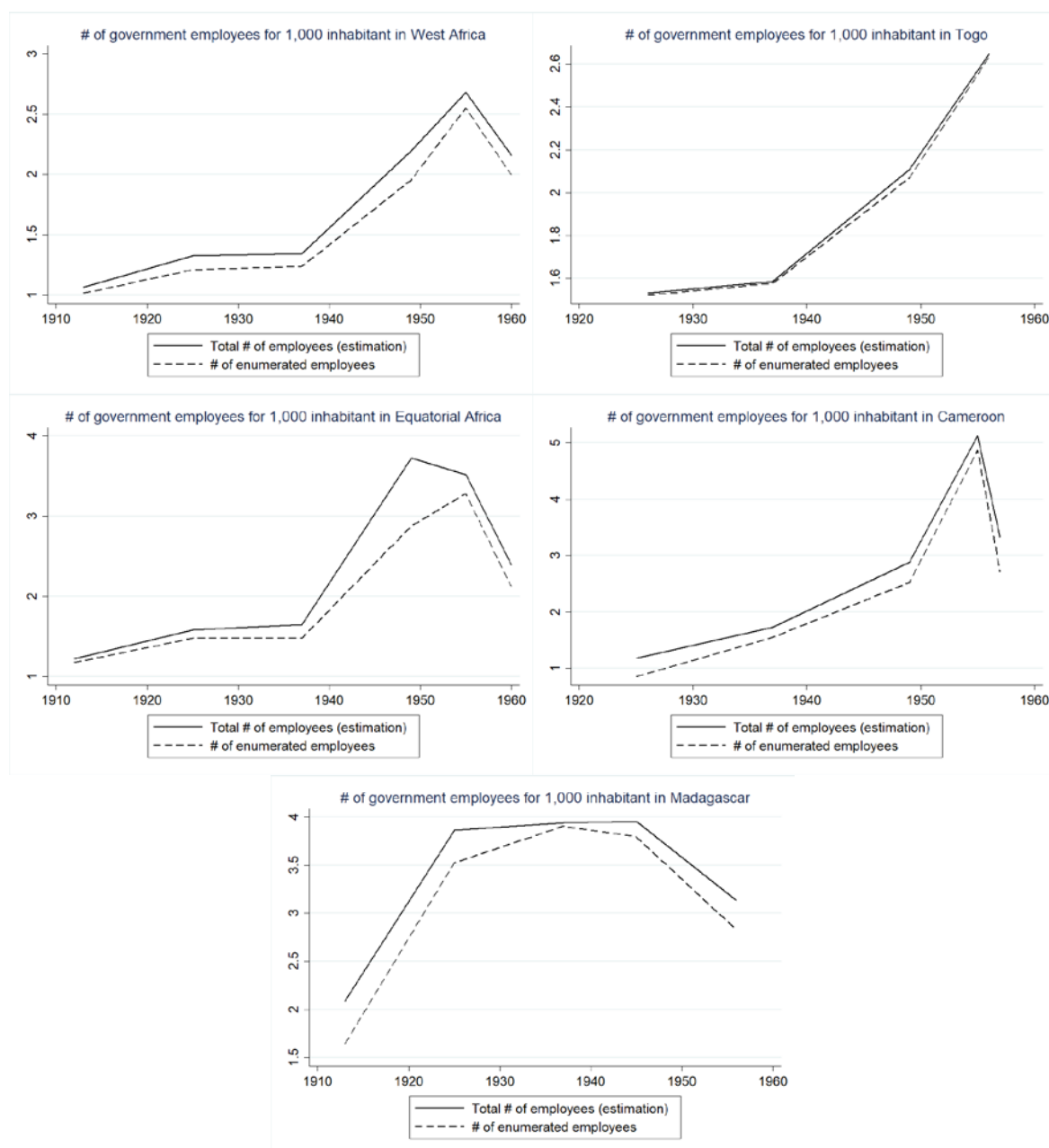
Figure 5: Estimated vs. enumerated number of government employees in North Africa and Indochina



very important.

Personnel data was collected for central budgets only (federal and colonial in the case of federations), which means that our personnel figure do not include the workers paid for public works on auxiliary budgets, nor the employees paid on the budget accounts of first-level administrative divisions. This is particularly problematic in Indochina and in Madagascar. In Indochina, the number of employees of the federal and colonial governments decreased after the decentralization reform of 1931 which gave more spending responsibilities to provinces. The drop in the number of government employees per 1,000 inhabitants from more than 1.7 to less than 1.4 between 1925 and 1937 is therefore misleading (figure 5). In Madagascar, the decentralization reform of 1946 considerably increased the share of provinces in total public expenditure, explaining the fall in the number of government employees between 1938 and 1955 (figure 6).

Figure 6: Estimated vs. enumerated number of government employees in Sub-Saharan Africa



Aggregation and year substitutions. For Indochina, West and Equatorial Africa, figures are aggregated at the level of the federation. As with monetary expenditure, when we could not find provisional budget accounts for a particular colony in a given year, we used the accounts of a close enough year.¹⁴ We could not find the budget account of French Soudan

¹⁴ In AOF, affected years and budget accounts are: budget général (1936 instead of 1937), Côte d'Ivoire (1926 instead of 1925), Dahomey (1957 instead of 1960), Guinée (1950 instead of 1949), Mauritania (1958 instead of 1960), and Niger (1958 instead of 1960). In AEF: Gabon (1958 instead of 1960), Oubangui-Chari

(present-day Mali) in 1925, 1949 and 1960. In this years in A.O.F., average wages per sector do not take French Soudan/Mali into account. In 1925 and 1949, total employment in A.O.F. is computed using the share of Soudan in the total employment of the federation in 1937 and 1955. In 1960, aggregate figures for A.O.F. are computed without Soudan/Mali, and without Guinea — in 1958, the federation of A.O.F. was dissolved, and Guinea gained independence. We could not find the budget account of Chad in 1949: average wages per sector in A.E.F. do not take Chad into account for this year, and total employment in A.E.F. is computed using the share of Chad in the total employment of the federation in 1955.

POPULATION, PRICES, AND GDP

POPULATION

To produce comparable estimates of expenditure and revenue per capita, we gathered data on total population. We also gathered data on European and other ethnic minority populations (Jews in North Africa, Chinese in Indochina, Chinese and Indians in Madagascar). The “Population” section of the “List of sources” below gives a more detailed list of all references used and where to find them.

Algeria

In Algeria, population in 1850 comes from CICRED (1974a). Population figures from the censuses of 1911, 1921, 1926, 1931, 1936, 1948 and 1954 come from the 1955 statistical yearbook of Algeria (Algeria, Sous-direction des statistiques, 1955). Population in 1960 comes from the 1960 UN demographic yearbook (United Nations, 1960). Population in 1966 comes from CICRED (1974a). Population from 1977 comes from The World Bank (2017).¹⁵ European population is defined as non-Muslim population, comprising French citizens (including Algerian Jews who were granted French citizenship by the 1870 Crémieux decree) and other Europeans. Population figures for non-Muslims are more detailed and come from the Algerian statistical yearbooks of 1933, 1948-1949 and 1955 (Algeria, Sous-direction des statistiques, 1933, 1948-49, 1955) who present retrospective figures as well as contemporary ones. Figures for 1958-1960 come from the 1961 and 1962 French statistical yearbooks (INSEE, 1961 & 1962). 1960 non-Muslim population comes from CICRED (1974a). Population figures between two dates are estimated by exponential interpolation, except for 1)

(1959 instead of 1960), and Tchad (1958 instead of 1960). In Indochina: budget général (1914 instead of 1913), Cochinchina (1915 instead of 1915 and 1924 instead of 1925).

¹⁵ To stay consistent with the colonial figures, which never comprise military population, we subtract from the WDI figures estimates of military population (representing around 1% of total population).

Muslim population before 1850, where we assume a growth rate of 0.5% per year, the rate given by CICRED (1974a) between 1850 and 1866); 2) Muslim population between 1866 and 1911, where our figures reflect a decrease in population between 1866 and 1872 due to epidemics and the Kabyle revolt of 1871-1872¹⁶; 3) Muslim population between 1954 and 1960, where we take into accounts the temporary departure of Algerian refugees to Tunisia and Morocco (UNHCR, 2000); 4) non-Muslim population between 1960 and 1966, where our figures reflect the departure of 800,000 French settlers in 1962

Morocco

During the colonial period starting in 1912, Morocco was divided between a French Protectorate and a Spanish Protectorate in the North representing about a tenth of total population.¹⁷ Morocco gained its independence from France in 1956 and Moroccan control over (part of) the Spanish zone was restored in 1958. Our population estimates comprise only the southern (French) zone until 1957, and both zones from 1958 onwards. Population in 1936 comes from CICRED (1974b). Earlier population figures are extrapolated backwards using the population growth rates of Frankema & Jerven (2014). Population in 1952 comes from Morocco (1960). Population in 1960 and 1971 comes from CICRED (1974b). Population after 1982 comes from The World Bank (2017). European population is French population (unlike in Algeria, Moroccan Jews were not granted French citizenship), given by the Moroccan statistical yearbook in 1921, 1926, 1931, 1936, 1947, and 1952 (Morocco, various dates). Jewish population comes from CICRED (1974b), Morocco (1960) and Moroccan statistical Yearbooks (Morocco, various dates). Population figures between two dates are estimated by exponential interpolation.

Tunisia

In Tunisia, population in 1911 comes from the 1947 statistical yearbook (Tunisia, Institut national de la statistique, 1947).¹⁸ Earlier population figures are extrapolated backwards using a yearly growth rate of 0.7%, fitting the estimates given by CICRED (1974c). Population figures in 1921, 1926, 1931, 1936, 1946, 1956, 1966, and 1971-1973 come from CICRED (1974c). Population after 1971 comes from The World Bank (2017). European population is mostly French, Italian, and Maltese (unlike in Algeria, Tunisian Jews

¹⁶ If we assume again a population growth rate of 0.5% a year between 1872 and the first reliable population census of 1911, we find that population decreased by 12% between 1866 and 1872.

¹⁷ The Spanish were also granted a Protectorate in the South, but its population was negligible.

¹⁸ Because colonial population figures tend to underestimate population, we multiply the 1911 population figure by the ratio of the CICRED (1974) figure over the 1947 statistical yearbook figure in 1921, a year for which we have both figures.

were not granted French citizenship). It is given by the 1947 Tunisian statistical yearbook for 1880, 1886, 1891, 1896, 1906, 1911, 1921, 1926, 1931, 1936, and 1946. It is given by the 1957/58 statistical yearbook for 1956. It is given by CICRED (1974c) for 1961 and 1966. Jewish population comes from Tunisian statistical yearbooks. Population figures between two dates are estimated by exponential interpolation.

Indochina

In Indochina, population figures for Vietnam (Cochinchina, Annam, and Tonkin) come from Bassino (2000) and Banens (2000). For Cambodia and Laos, we use The World Bank (2017) after 1960. Before 1960, population figures are extrapolated backwards using the population growth rate of Vietnam. The figures thus obtained are slightly larger than the ones provided in the statistical yearbooks of French Indochina (French Indochina, Bureau de la statistique générale, various dates). European population and Chinese population are given by the statistical yearbooks of French Indochina. European population is composed mostly of French, but the figures given by statistical yearbooks also include a small minority of Americans and Japanese.

West and Central Africa

Population in Afrique Occidentale Française, Afrique Equatoriale Française, Togo and Cameroon comes from Frankema and Jerven (2014) between 1850 and 1960 and from The World Bank (2017) after 1960. The population given by Frankema and Jerven for Mali and Niger at independence in 1960 is lower than the population given by the World Bank. We therefore opted for higher population growth rates from 1948 to 1960 in order to make the two series consistent. Frankema and Jerven give figures for African countries in their post-independence borders, but French Cameroon was smaller during the colonial period because it was reunited with former British Cameroon in 1961. We adjust colonial population figures by removing 15% of French Cameroon's population, which corresponds to the ratio obtained by combining French and British colonial estimations (France, Ministère de la France d'Outre-mer, 1959; Great Britain, Colonial Office, various dates). European population come from the statistical yearbooks of A.O.F. and A.E.F., and, for Togo and Cameroon, from France, Ministère de la France d'Outre-mer (1959).

Madagascar

In Madagascar, population comes from the statistical yearbooks of Madagascar and from The World Bank (2017) after 1970. Population between two dates is estimated by

exponential interpolation. Before 1906, we extrapolate backwards using the population growth rate of 0.3% given by Frankema and Jerven (2014). European population and Asian population are given in statistical yearbooks and France, Ministère de la France d’Outre-mer (1959).

PRICES

In Northern and Sub-Saharan Africa, monetary amounts collected in various budget sources are usually given in French francs. Just after World War II, a new currency was introduced in the colonies of Sub-Saharan Africa, the CFA franc (“*franc des colonies françaises d’Afrique*”), worth 1.7 Metropolitan francs. It was worth 2 Metropolitan francs from 1948 onwards. Our own series show that the official exchange rate roughly compensated for the inflation differential between Metropolitan France and French West Africa, but that the CFA franc was likely overvalued in French Equatorial Africa, Cameroon and Madagascar. In the French Indochinese Union, the official currency from 1884 onwards was the *piastre*, a silver currency similar in weight to the Mexican peso and the Trade dollar. The *piastre* remained on a silver standard until 1920 and was then pegged to the franc at a variable rate. In 1930, the exchange rate was fixed at 1 *piastre* for 10 francs. After the Second World War and the Japanese occupation, the exchange rate was fixed at 1 *piastre* for 17 francs, but it was largely overvalued, as evidenced by a black market exchange rate of less than 10 francs. Our own series show that inflation was far greater in Indochina than in Metropolitan France during the independence war years.

When considering public finance series, how should we deflate and adjust for purchasing power parity? The answer partly depends on the type of questions asked, and practical solutions are greatly constrained by the availability of price and wage data for the period considered. Under the angle of revenue, it makes sense to use something akin to a GDP deflator, especially when considering the share of public revenue in GDP as an indicator of fiscal capacity. Because of the limited availability of price data, we deflate and adjust for purchasing power using a basket of consumer goods. Under the angle of expenditure, if we want to compare across time and across space the quantity of public goods and services provided, a specific public spending deflator would be more appropriate, especially for taking into account differences in public sector wages. Building such a deflator would require detailed information on the skill composition of government sector jobs and corresponding salary scales. The lack of such detailed data leads us to deflate public expenditure with the same Consumer Price Index (CPI) deflator we use for public revenue. This has the additional

advantage of simplicity: because expenditure and revenue are expressed in the same unit of account, deficits can be computed by subtracting net expenditure from net revenue. However, in our cross country comparisons as well as in our time series, a large share of the variation in public expenditure is accounted for by differences in public sector wages, something we evidence by also providing series on the number of government employees per capita and on average wages. In fact, every possible public expenditure deflator taking into account public sector wages will be a weighted average of two extreme scenarios: in the first one (CPI based adjustment), we assume that differences in real wages are a perfect indicator of differences in labour productivity, in the second one (number of employees per head), we give the same value to each government job, regardless of differences in skills and productivity.

In the end, we adjust all our monetary aggregates using the following method: we use local CPIs to express monetary amounts in 1937 local currency (francs and *piastres*), and then use the relative cost of a basket of goods to adjust for purchasing power parity in 1937. Local CPIs were found in various statistical abstracts (see the “Prices” section of the “List of sources” below). The earliest ones start in 1913, and most of them start in 1938. Before this date, we convert monetary amounts in French francs and deflate using the inflation rate of Metropolitan France from Levy-Leboyer and Bourguignon (1985) before 1890, and Villa (1994) after. The conversion matters only for Indochina, as in all other colonies before World War II, the official currency was the French franc. In Sub-Saharan Africa (A.O.F., A.E.F., Togo, Cameroun and Madagascar), we could not find information on price inflation in the second half of the 1950s. We infer price inflation between 1953 and 1960 by taking the difference between the nominal GDP growth and real GDP growth (see section on GDP below).¹⁹ After World War II, we rely on local CPIs from The World Bank (2017).

¹⁹ Nominal GDP in 1953 is from France, Direction des Affaires économiques et du Plan du ministère de la France d’outre-mer (1955), nominal GDP in 1960 is from The World Bank (2017). Real GDP growth in the 1950s is from the Maddison Project. In Togo, we did not find nominal GDP figures nor prices before 1960. Before this date, inflation is assumed to be the same as in A.O.F.

Figure 7: Inflation differential between France and its colonies

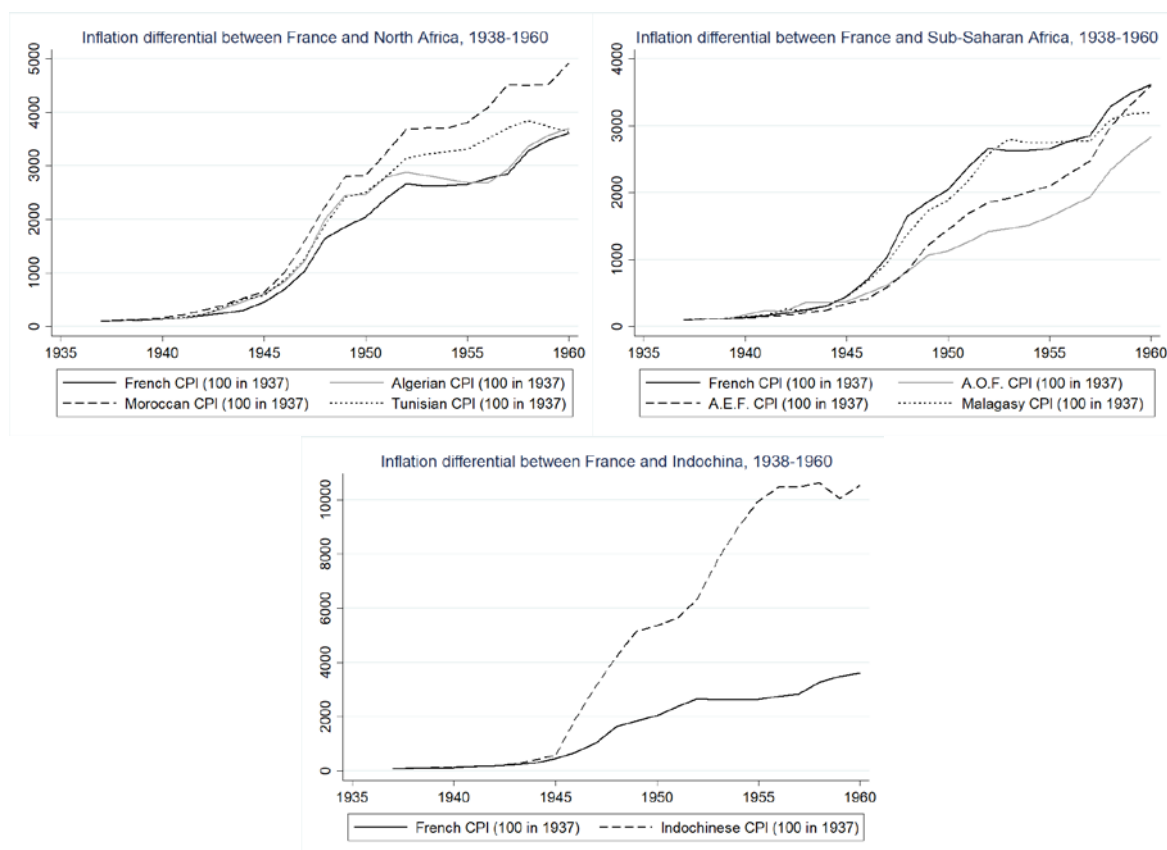


Figure 6 compares the evolution of prices in France and its colonial Empire between 1939 and 1960. The first panel displays the evolution of local consumer price indices in France and the North African territories of Algeria, Morocco, and Tunisia. During WW2, inflation was higher in North Africa than in France, yet in Algeria prices had converged to metropolitan levels as early as in 1955 and then followed the metropolitan curve closely until 1962. In Tunisia convergence took until 1960, that is after independence, and Morocco until mid-1970s. 1937-1946 inflation had been lower in France's Sub-Saharan possessions (panel 2), particularly in A.E.F, Cameroon, followed by A.O.F and Togo, the exception was Madagascar. The introduction of the CFA franc in December 1945, worth 1.7 metropolitan francs, and even more its revaluation in 1948 to 2 metropolitan francs, compensated exactly for the inflation differential on the year 1948, for all Sub-Saharan territories excepting Madagascar. Between that date, and 1960, prices catch-up with metropolitan levels, especially in A.E.F where it seems that the CFA franc turned strongly overvalued. In Indochina (panel 3), the divergence between the 2 price indices is very wide, especially after World War 2. Despite this inflation differential, the exchange rate was fixed at 1 Indochinese *piastre* for 10 francs from 1930 to 1945, and was increased instead of decreased in 1945, at 1 *piastre* for 17

francs. The discrepancy between the official exchange rate and the black market rate gave rise to the trafficking documented in Despuech (1953). The rate of 1 for 10 was restored in 1953.

Table 4: products and weights used to adjust for PPP in 1938

Product	Weight
Starch (flour, rice)	11
Meat (chicken, beef)	18.4
Eggs	14.5
Cooking oil	3.8
Grocery (sugar, salt)	12.1
Petroleum	3.4
Electricity	0.7
Soap	8.2
Shoes	12.4
Haircut	15.5

Once we have expressed all monetary amounts in 1937 local currency using the local CPIs, we adjust for purchasing power parity (PPP) in 1937 using the relative cost of a basket of good. The products and weights used (displayed in table 4) closely follow those used by the French statistical office in the 1950s (INSEE, 1951).²⁰ They match the consumption pattern of a European or a member of the colonized elite. Table 3 presents the price of our basket of goods relative to Algeria (which was officially part of France), using the official conversion rate for the *piastre*. In Sub-Saharan Africa, where the Metropolitan franc was used in 1937, we actually would not be far off to assume that one franc had the same purchasing power everywhere. In Indochina, the purchasing power of the franc implied by the official exchange rate of 10 francs for a *piastre* is far greater than in the rest of the Empire.

Table 5: Price of the consumer basket relative to Algeria in the French Empire

Algeria	1.00
Morocco	0.88
Tunisia	0.95
Indochina	0.62
West Africa	0.92
Equatorial Africa	0.93
Cameroon	0.83
Madagascar	0.81

²⁰ Since we always consider relative prices of baskets of goods, there is no need to specify units and quantities.

GROSS DOMESTIC PRODUCT

Though evidence on historical GDP in Africa is scarce, some measure of GDP is needed to put fiscal figures in economic context and express public revenue as a share of GDP, a standard and useful measure of fiscal capacity (Besley and Persson, 2014). To obtain yearly estimates of real GDP per capita, we combine two main sources: contemporary national accounting exercises give us nominal GDP from the 1950s onwards, while historians' estimations of GDP growth in volume give us real GDP growth before 1950. These sources, laid out in details in the "Gross domestic product" section of the "List of sources" below, are combined with our price deflator, PPP adjustor, and population series to obtain series of real GDP per capita in 1937 francs. The deflator and PPP adjustor used to convert nominal GDP in 1937 PPP francs are the same as those used to deflate our public finance data, making the computation of GDP shares straightforward. Most of our sources estimate real GDP growth before 1950 only between a couple of key years.²¹ In the absence of further information, we assume constant annual growth rates in between these key years. Our estimates are therefore moving averages missing the yearly variations in GDP growth due, for instance, to fluctuations in the prices of exported primary products. This means that the year to year variation in share of revenue in GDP might be misleading because our GDP series are, by construction, smooth, while our revenue series are not.

In Algeria, we take yearly nominal GDP between 1950 and 1957 from Algeria, Service de statistique générale (1958, p. 54), in 1958 and 1959 from Amin (1966, p. 194-195), and from 1960 onwards from The World Bank (2017). To obtain real GDP figures before 1950, we use real GDP growth estimated by Amin (1966, p.101) between 1880 and 1950 and by Maddison (2003) between 1820 and 1880.

In Morocco, we use the nominal GDP series of The World Bank (2017) from 1960 onwards. We use the growth of real GDP of Amin (1966) between 1920 and 1960, and of Maddison (2003) between 1820 and 1920. We do not use the nominal GDP series of Amin directly because the figure he gives for 1960 is 25% higher than the one given by The World Bank (2017).

In Tunisia, we take nominal GDP in 1957 and 1960 from Amin (1966, p. 297), and nominal GDP after 1965 from The World Bank (2017). Real GDP in other years is computed using the real growth rates of Zarka (1964, p. 214) between 1950 and 1960, and the growth

²¹ Maddison (2003) gives an estimate of real GDP per capita for "Other countries of Black Africa" in 1820, 1870, and 1913. Amin (1966) gives estimates of real GDP in 1880, 1910, 1920, 1930, 1955 and 1960 in the Maghreb.

rate of Maddison between 1960 and 1965. Before 1950, we use the growth rate of real GDP given by Amin (1966, p. 35 & p. 101) between 1920 and 1950, and Maddison (2003) between 1820 and 1920.

In Indochina, we take the nominal GDP series of Bassino (2000) for Vietnam (Cochinchina, Annam, and Tonkin) between 1820 and 1970, that we deflate using our CPI. The real GDP per capita of Cambodia and Laos is assumed to be equal to the real GDP per capita of Annam.

In Sub-Saharan Africa (A.O.F, A.E.F., Togo, Cameroon, and Madagascar), we rely on the nominal GDP series of The World Bank (2017) after 1960. In 1953, we rely on national accounts established by the French Overseas Ministry for A.O.F., A.E.F, Cameroun, and Madagascar (France, Direction des Affaires économiques et du Plan du ministère de la France d'outre-mer, 1955). Growth rate of real GDP per capita between 1953 and 1960 are taken from the Maddison Project. Because we do not have good data on inflation in the 1950s, the difference between the growth rate of nominal GDP per capita and the growth rate of nominal GDP per capita gives us a measure of price inflation that we use to deflate our public finance series.²² Real GDP per capita before 1953 is obtained using the real GDP growth rates given in Maddison (2003).

VARIABLE DICTIONARY

PUBLIC FINANCE DATABASE

Variables in the public finance database are given per head in 1937 PPP Francs. To recover nominal amounts as they appear in the budget accounts, one needs to divide by the price deflator (deflator) and the purchasing power parity adjustor (PPP_adjustor) and multiply by population (pop_tot).

Region

One of nine colonies, protectorates, mandates, or federations or colonies: Algeria, Morocco, Tunisia, Indochina, West Africa, Togo, Equatorial Africa, Cameroon, and Madagascar.

²² Because we did not find estimates of nominal GDP in the 1950s in Togo, inflation in the 1950s is assumed to be the same as in A.O.F. Nominal GDP in 1960 is deflated in 1937 PPP F using the prices of A.O.F., and real GDP is then computed using the real growth rates of Maddison (2003).

Year

Net public expenditure (NPE)

Net public expenditure is total public expenditure net of transfers to reserve funds, external loans, subsidies and debt service. It is a consolidated aggregate, meaning that it is net of the various financial transfers (loans, subsidies, etc.) between different public budgets accounts within the same region (federal, colonial, and auxiliary budgets, and budgets of first-level administrative divisions). However, NPE includes subsidies and loans to firms and institutions located within the region, as well as subsidies and loans to second-level administrative divisions (municipalities). NPE also includes the civilian expenditure recorded in the budget accounts of the French Ministry of Colonies and Ministry of War. After independence, when Franc Zone reports are used as sources, NPE is computed as total expenditure minus debt service as recorded in Franc Zone reports, minus all external loans and subsidies received by the country recorded in the Franc Zone report (except when we know these emanate from a private source or a non-OECD country), plus net OECD ODA (loans and grants) received by the country (see “Budget accounts considered and sources used” above).

Administration expenditure (exp_administration)

Administration expenditure comprises personnel and material expenses destined to general and territorial administration. It comprises financial transfers to autochthonous political authorities, such as the king of Laos, or the sultan of Morocco.

Security expenditure (exp_security)

Security expenditure comprises personnel and material expenses of the police and prisons.

Justice expenditure (exp_justice)

Justice expenditure comprises personnel and material expenses destined to Autochthonous and European justice.

Financial services expenditure (exp_finserv)

Financial services expenditure comprises personnel and material expenses destined to tax collection, the management of the public debt, and the management of government monopolies (on salt, opium, etc.)

Education expenditure (exp_education)

Education expenditure comprises personnel and material expenses destined to public education, subsidies to private schools, and scholarships. School construction expenses are classified as infrastructure expenditure. In all French colonies, schools were segregated into a European system and a system for the autochthonous population. In Algeria between 1904 and 1948, and in Morocco between 1926 and 1930, it is possible to identify education expenditure for Autochthones (**exp_education_aut**) and for Europeans (**exp_education_eur**). The two subcategories do not necessarily sum to total education expenditure because some expenses were common to both education systems. Education expenditure for Autochthones and Europeans are expressed per head of the relevant population: expenditure for Europeans are divided by European population (pop_eu) and expenditure for Autochthones are divided by Autochthonous population (pop_tot minus pop_eu).

Religion expenditure (exp_religion)

Religion expenditure is positive only in Algeria, where the government took charge of the personnel and material expenses of the 4 monotheist religions (Islam, Judaism, Protestantism, and Catholicism). The law of separation of church and state was only partially applied in Algeria, where the government continued subsidising religions after 1907, and notably continued paying the wages of the Muslim religious personnel in an effort to control Islam and avoid political turmoil (Saaidia, 2016).

Health expenditure (exp_health)

Health expenditure comprises the personnel and material expenses destined to health, sanitation, labor inspection, and welfare. Hospital and health centers construction expenses are classified as infrastructure expenditure.

Infrastructure expenditure (exp_infrast)

Infrastructure expenditure comprises expenses for public works, both the construction of new infrastructure and buildings and the maintenance of existing ones. The construction of new railway lines or telegraphic lines falls in this category, but subsidies to railway companies are classified as production support expenditure, as well as the operating expenses of posts and telecommunications. Infrastructure expenditure also comprises the subsidies to second-level administrative divisions destined to the maintenance of local roads (in Algeria only).

Production support expenditure (exp_prodsup)

Production support expenditure comprises subsidies to private and public or semi-public entities whose budgets are not already part of the public expenditure aggregate (like railway companies). It also includes expenses on public services destined to enhance or support production, like posts and telecommunications, power plants, printing department, meteorological department, civil aviation, forestry and mining departments, agricultural research, merchant navy, etc.

Other expenditure (exp_other)

Other expenditure is equal to the different between net public expenditure (NPE) and the sum of all previous items of expenditure: administration, security, justice, financial services, education, religion, health, infrastructure, and production support. Expenditure remaining from the previous financial year (*Dépenses d'exercices antérieurs / d'exercices clos*) is allocated between the different items of expenditure in proportion of their weight in total expenditure.

Military expenditure (exp_mili_met and exp_mili_co)

Our measure of net public expenditure includes civilian expenditure only. Military expenditure is given separately. The bulk of colonial military expenditure appears in the budget accounts of the French Ministry of the Colonies and Ministry of War and is given by the variable **exp_mili_met**. Some items of military expenditure given by the Metropolitan budget accounts are civilian in nature and were added to the relevant categories of net public expenditure (**exp_health**, **exp_infrastructure**, and **exp_prodsup**). On the revenue side, they are considered as subsidies from France. Military expenditure appears directly in colonial budget accounts only in Algeria between 1830 and 1900 and between 1904 and 1937 (budget accounts of Southern Territories only), and in Morocco between 1921 and 1937, and in 1956. It is given by the variable **exp_mili_col**.

Net public revenue (NPR)

Net public revenue is public revenue net of transfers from reserve funds, external borrowing, subsidies, interests and reimbursements. It is a consolidated aggregate, meaning that it is net of various financial transfers (loans, subsidies, etc.) between different public budgets accounts within the same region (federal, colonial, and auxiliary budgets, and budgets of first-level administrative divisions). However, NPE

includes transfers (subsidies, loans, and reimbursements) from firms and institutions located within the region, as well as transfers from second-level administrative divisions (municipalities).

Tax revenue (taxrevenue)

Tax revenue is the sum of head taxes, external trade taxes, intermediate taxes, and modern taxes

Head taxes (re_headtax)

Revenue from the head tax (*capitation*), in theory a lump-sum tax, in practice a tax levied at the village level by local chiefs and roughly proportional to population. This category also includes cattle taxes (in Tunisia, Indochina, West and Equatorial Africa, Togo, Cameroon, and Madagascar), and labor tax redemptions.

External trade taxes (re_trade)

External trade taxes comprise export taxes (**re_trade_exp**) and import taxes (**re_trade_imp**), as well as harbor dues not attributable to export or import taxes (*octroi de mer* in Algeria). Taxes on the consumption of imported products are considered as import taxes (**re_trade_imp**).

Intermediate taxes (re_intermediate)

Intermediate taxes comprise taxes with an element of proportionality, but which do not require the frequent collection of statistical information on firms or individuals. They include direct intermediate taxes (**re_interm_di**), such as land taxes and business licenses (*patente*), and indirect intermediate taxes (**re_interm_in**), such as circulation taxes and taxes on the consumption of specific luxury goods (alcohol, sugar, tobacco).

Modern taxes (re_modern)

Modern taxes comprise taxes which require the frequent collection or self-declaration of detailed economic information on individuals and firms. Direct modern taxes (**re_modern_di**) are personal income taxes (*impôt sur le revenu*, as well as the Moroccan tax on agricultural income called *tertib*), taxes on benefits, and the tax on interests and dividends (*impôt sur le revenu des valeurs mobilières*). Indirect modern taxes (**re_modern_in**) are broad-based consumption taxes, taxes on sales revenue

(*impôts sur le chiffre d'affaire*), and turnover taxes (called *taxes sur la production*, *taxe unique à la production* in Algeria, and *taxe sur les transactions* in Tunisia).

Monopoly revenue (re_monopoly)

Monopoly revenue includes revenue from any economic activity on which the government had a legal monopoly. It comprises revenue from industrial operations (including post and telegraph receipts) and administrative services, and revenue from the sale of various goods on which the colonial government had a monopoly, such as salt (in Tunisia and Indochina), tobacco (in Morocco, Tunisia, Indochina, and Madagascar), alcohol (in Madagascar and Indochina), and opium (in Indochina). It also includes excess revenue of public railway companies transferred to the government's budget, as well as various registration fees.

Other sources of internal revenue (re_other)

Other sources of internal revenue are the difference between Net public revenue (NPR) and the sum of all previous sources of internal revenue: head taxes, monopoly revenue, external trade taxes, intermediate taxes, modern taxes. Revenue collected in the current fiscal year on account of the previous fiscal year's budget (*Recettes d'exercices antérieurs / d'exercices clos*) is allocated between the different items of revenue in proportion of their weight in total revenue.

Net surplus/deficit (deficit)

Net surplus/deficit is the difference between net public revenue and net public expenditure ($deficit = NPR - NPE$). The net deficit is, by construction, financed by net transfers from reserve funds, net borrowing, and net subsidies (another way to put it is that the net surplus is composed of net transfers to reserve funds, net loans, and net subsidies given out). Unfortunately, net transfers from reserve funds cannot be systematically computed, but we provide variables for the other components of the net deficit.

Net subsidies (netsubto)

Net subsidies are subsidies received from abroad net of subsidies sent abroad. During the colonial period, the bulk of net subsidies are net subsidies from metropolitan France (**netsubfr**), equal to subsidies from France to the colony minus subsidies from

the colony to France. After 1960, net subsidies are aid grants from OECD-DAC aid data

Net borrowing (netborto)

Net borrowing per capita is equal to loans received minus loans given out, minus interests and reimbursements paid out, plus interests and reimbursements paid in. After 1960, net borrowing is net loan aid from OECD-DAC aid data.

NPE of first-level administrative divisions (NPE_adm1)

First level administrative divisions are *départements* in Algeria, *régions* in Morocco, and *provinces* in Indochina and Madagascar. Their expenditure is already taken into account in the consolidated aggregate (NPE).

NPR of first-level administrative divisions (NPR_adm1)

First level administrative divisions are *départements* in Algeria, *régions* in Morocco, and *provinces* in Indochina and Madagascar. Their revenue is already taken into account in the consolidated aggregate (NPR).

Tax revenue of first-level administrative divisions (tax_adm1)

First level administrative divisions are *départements* in Algeria, *régions* in Morocco, and *provinces* in Indochina and Madagascar. The tax revenue of first level administrative divisions is already taken into account in the consolidated aggregate (NPR). Tax revenue of the central government only is simply *taxrevenue – tax_adm1*.

NPE of second-level administrative divisions (NPE_adm2)

Second-level administrative divisions are municipalities (*communes*). Their expenditure is not taken into account in the consolidated aggregate (NPE), because it is often missing. NPE_adm2 is net of all transfers, including subsidies from the central government and first-level administrative divisions.

NPR of second-level administrative divisions (NPR_adm2)

Second-level administrative divisions are municipalities (*communes*). Their revenue is not taken into account in the consolidated aggregate (NPR), because it is often missing. NPR_adm2 is net of all transfers, including subsidies to the central government and first-level administrative divisions.

Net subsidies from central government to municipalities (sub_gcadm2) and from municipalities to central government (sub_adm2_gc)

For years in which NPE_adm2 and NPR_adm2 are not missing, it is possible to compute total consolidated public expenditure and revenue. When computing total net public expenditure and revenue, one should subtract from net public expenditure the subsidies to municipalities (**sub_gcadm2**), and subtract from net public revenue the transfers from municipalities (**sub_adm2gc**). NPE_adm2 and NPR_adm2 , however, are already net of transfers to and from the central government and first-level administrative divisions. Denoting with a star total consolidated net public expenditure and revenue, we have $NPE^* = NPE - sub_gcadm2 + NPE_adm2$, and $NPR^* = NPR - sub_adm2gc + NPR_adm2$.

GDP per capita in 1937 PPP francs (GDP)

The many assumptions behind the building of yearly GDP per capita figures are laid out in details in the section “Population, prices and GDP” above. We used the same deflator to deflate nominal GDP and public finance figures, so that GDP shares can be computed directly by dividing the relevant variable by GDP.

Total population (pop_tot)

See section “Population, prices, and GDP” above and the “List of sources” below.

European population (pop_eu)

See section “Population, prices, and GDP” above and the “List of sources” below. In Algeria, European population includes Jews who were given French citizenship by the 1870 Crémieux decree. In Morocco and Tunisia, Jews were not given French citizenship and are included in the non-European minority population (pop_min). In Indochina, European population comprises a small number of Japanese and Americans.

Non-European minority population (pop_min)

See section “Population, prices, and GDP” above and the “List of sources” below. Non-European minority population is Jewish population in North Africa (except in Algeria where Jews were given French citizenship), Chinese population in Indochina, and Asian (Chinese and Indian) population in Madagascar.

Price deflator (deflator)

See section “Population, prices, and GDP” above and the “List of sources” below. The price deflator, base 1 in 1937, was used to deflate nominal amounts, along with the PPP adjustor. All public finance variables are given per head in 1937 PPP Francs. To recover nominal amounts, one needs to divide by deflator and by PPP_adjustor.

Purchasing power parity adjustor (PPP_adjustor)

See section “Population, prices, and GDP” above and the “List of sources” below. The PPP adjustor adjusts for purchasing power parity in 1937. All public finance variables are given per head in 1937 PPP Francs. To recover nominal amounts, one needs to divide by deflator and by PPP_adjustor.

PERSONNEL DATABASE

Region

One of nine colonies, protectorates, mandates, or federations or colonies: Algeria, Morocco, Tunisia, Indochina, West Africa, Togo, Equatorial Africa, Cameroon, and Madagascar.

Year**Total revenue (re_to)**

Total revenue, not consolidated. This is simply the sum of gross revenue over all the budget accounts (federal and colonial) in the region.

Total expenditure (exp_to)

Total expenditure, not consolidated. This is simply the sum of gross expenditure over all the budget accounts (federal and colonial) in the region.

Average wage of government employees (avwage_to)

Average wage of government employees, all sectors, including bonuses and allowances, in 1937 PPP Francs. Computed by dividing total personnel expenditure attached to a given number of employees by the number employees. Government is only colonial government in colonies, federal and colonial governments in federations of colonies, excluding the local governments of first- and second-level administrative divisions.

Total number of government employees per 1,000 inhabitants (nbemppc_to)

Total number of employees is the sum of total number of enumerated employees and estimated number of employees when items of personnel expenditure are not attached to a precise number (the monetary amount is divided by the average wage). Government is only colonial government in colonies, federal and colonial governments in federations of colonies, excluding the local governments of first- and second-level administrative divisions.

Average wage and number of employees by sector

Average wages are in 1937 PPP francs (divide by deflator and PPP_adjustor to recover the nominal wage). Number of employees is given per 1,000 inhabitants (multiply by pop_tot to recover the actual number of employees). The definition of each sector corresponds exactly to the definition given in the variable dictionary for the public finance database.

GDP per capita (GDP), total population (pop_tot), price deflator (deflator), purchasing power parity adjustor (PPP_adjustor)

See definition in the variable dictionary for the public finance database.

LIST OF SOURCES

To build our public finances and personnel database, we gathered data from around 1,700 official publications. These publications were accessed in several libraries and public archives: the Bibliothèque Nationale de France (BnF) in Paris, the Bibliothèque Universitaire des Langues et Civilisations (BULAC) in Paris, the Bibliothèque Cujas (BC) in Paris, the Bibliothèque de documentation internationale contemporaine (BDIC) in Nanterre, the Centre des Archives Economiques et Financières (CAEF) in Savigny-le-Temple, the Bibliothèque Universitaire de Grenoble (BUG) in Grenoble, and the Centre des Archives de l'Outre Mer (CAOM) in Aix-en-Provence. We indicate in brackets the place (or places) where we accessed the source and the location number, when relevant. For the Bibliothèque Nationale de France, a location number starting with NUMP indicates that the publication was digitized and made available on the BnF's digital library Gallica (www.gallica.bnf.fr). If no location number is indicated, the source comes from a private collection. When a series of publication was printed by several publishers, we give only the first publisher and place of publication.

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Cost of living index for Europeans in Saigon and in Hanoi (1911-1940)

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Consumer price index for Europeans in Saigon and Hanoi (1949-1954)

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Afrique Occidentale Française

In Afrique Occidentale Française, we use import prices to measure inflation between 1938 and 1944. We track the price evolution of a yearly subsistence basket composed of 195 kg of flour, 5 liters of oil, 1.3 kg of sugar, 1.3 kg of soap and 600 grams of cotton cloth. See Allen (2009) and Frankema and van Waijenburg (2012) for discussions of the methodology of subsistence baskets. Starting in 1945, we rely on CPI computed by the statistical office of A.O.F..

Import prices of flour, oil, sugar, soap, and cotton (1938-1944)

Afrique occidentale française, Service de la statistique générale. *Annuaire statistique de l'Afrique occidentale française. Vol. 4 : 1939-1951*. Dakar: Impr. de la Mission. Table IV, p. 264-267. [BnF: 4-LC32-139]

Cost of living index for Europeans in Dakar (1945-1955) and Abidjan (1947-1955)

Afrique occidentale française, Service de la statistique générale. *Annuaire statistique de l'Afrique occidentale française. Vol. 5 : 1950-1954*. Dakar: Impr. de la Mission. Tables 1-3-21 and 1-3-22, p. 330-331. [BnF: 4-LC32-139]

Togo

We did not find prices for Togo before 1960 and we use the consumption price index of A.O.F. (see above).

Afrique Equatoriale Française

Consumption price index for Europeans in Brazzaville (1938-1955)

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Consumption price index for Europeans in Bangui (1951-1955) and Fort-Lamy (1950-1955)

Afrique équatoriale française, Territoire de l'Oubangui-Chari, Statistique générale. *Annuaire statistique de l'Oubangui-Chari. Vol. 1 : 1940-1955*. Bangui. Table 2, p. 179 and table 4, p.181. [BnF: MFICHE 4-LC32-182]

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Madagascar

Consumption price index for Europeans in Antananarivo (1938-1951)

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Consumption price index for Europeans in Antananarivo (1952-1955)

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